THIRTY-NINTH ANNUAL REPORT

OF THE

DEPARTMENT OF MARINE AND FISHERIES

1906

MARINE

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OTTAWA
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1907

[No. 21—1907].

To His Excellency the Right Honourable SIR ALBERT HENRY GEORGE, EARL GREY, VISCOUNT HOWICK; BARON GREY OF HOWICK; A BARONET, G.C.M.G, &C., &C., &C., &C., *Governor General of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith, for the information of Your Excellency and the Legislature of Canada, the Thirty-Ninth Annual Report of the Department of Marine and Fisheries, Marine Branch.

I have the honour to be,

Your Excellency's most obedient servant,

LOUIS-PHILIPPE BRODEUR,
Minister of Marine and Fisheries.

DEPARTMENT OF MARINE AND FISHERIES,

OTTAWA, October, 1906.

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REPORT

OF THE

DEPUTY MINISTER OF MARINE AND FISHERIES.

To the Honourable LOUIS-PHILIPPE BRODEUR,
Minister of Marine and Fisheries.

SIR,—I have the honour to report on the transactions of the Marine Branch of this department for the fiscal year ended June 30, last, and to give an account of a portion of the work since that date.

The demand for increased aids to navigation have continued, and as far as possible, new aids have been established and improvements made in many instances to the aids formerly existing. The result on the whole has therefore been a reduction of the dangers to navigation in the waters of the Dominion.

The re-arrangement of the different branches made the year previous, was found to lead to a more effective carrying out of the work of the department. The experience gained in the past year, in all branches of the service, has been valuable in demonstrating the success of the methods in use and showing where improvements can still be made. The detailed work connected with carrying out the policy of the department has vastly increased, making it necessary to increase the staff of officers and employees inside and outside.

The maintenance of the work in the ship channel in the St. Lawrence river and the government shipyard at Sorel increased the necessity for new steamers, dredges, other plant and equipment.

The great variety of the public service, embraced within the operations of the department, is shown by the following general subdivisions of the Marine Branch alone.

THE GENERAL SUBDIVISIONS OF THE MARINE BRANCH.

The construction of lighthouses and fog-alarms.
The maintenance of lights, gas buoys and other buoys.
The lighthouse board which decides the necessity for aids to navigation.
The hydrographic surveys.
The tidal surveys.
The ship channel St. Lawrence river and Sorel works.
Meteorological and magnetic service.
Investigation into wrecks.

Board of steamboat inspection.
Cattle shipments inspection.
Wireless telegraph service.
Signal service.
Life saving service.
Marine hospitals.
Submarine signalling.
Shipping under the Merchants' Shipping Act.
Legislation and administration of laws relating to the Department of Marine and Fisheries.
Humane service in connection with seamen.
Wrecking plant subsidized.
Winter communication.
Removal of obstructions to navigation.
Examination of masters and mates, and issuing certificates.
Naval militia.
Pilotage.
Government of ports and proclaiming of harbours in the Dominion.
Control of government wharfs.
Dominion steamers, Marine and Fisheries.

EXPENDITURE.

The expenditure for the fiscal year ending June 30, last, was as follows:—

LIGHTHOUSE AND COAST SERVICE.

Maintenance of lights	$1,082,718 36
Construction of lights	1,605,778 59
	$2,688,496 95
Appropriation for maintenance and construction	$2,724,000 00
Deduct expenditure	2,688,496 95
Expenditure less than appropriation	$ 35,503 05

OCEAN AND RIVER SERVICE.

Appropriation	$1,048,100 00
Expenditure	1,012,265 73
Expenditure less than appropriation	$ 35,834 27

HYDROGRAPHIC SURVEYS—SCIENTIFIC INSTITUTIONS AND ST. LAWRENCE SHIP CHANNEL.

Appropriation	$1,326,850 00
Expenditure	1,167,118 90
Expenditure less than appropriation	$ 159,731 10

MARINE HOSPITALS—STEAMBOAT INSPECTION—CIVIL GOVERNMENT.

Appropriation	$ 212,119 36
Expenditure	197,371 08
Expenditure less than appropriation	$ 14,748 28
Total appropriation	$5,311,069 36
Total expenditure, Marine Branch	5,065,252 66
Expenditure less than appropriation	$ 245,816 70
Total expenditure, Marine Branch	$5,065,252 66
Total expenditure, Fisheries Branch	968,375 09
Total expenditure of department	$6,033,627 75

NOTE.—The fisheries expenditure is merely added to show the total expenditure of the department, and has no connection with this report.

LIGHTHOUSE SERVICE.

The lighthouse service of the Dominion is divided as follows:—The Ontario division, embracing all lights from Montreal westward to the Northwest Territories; the Quebec division, extending below Montreal and including the St. Lawrence river from Platon and the gulf of St. Lawrence and strait of Belle Isle; the Montreal division, including the St. Lawrence river from Montreal to Platon; the Nova Scotia division, including St. Paul's island, Cape Breton, Sable island and Cape Race, Newfoundland; the New Brunswick division, the Prince Edward Island division and the British Columbia division, each including lights within the provincial boundaries.

The several districts, with the exception of the district above Montreal, are in charge of agents who receive instructions from the department and report annually, in addition to communicating with the department, in connection with all matters relating to their agencies.

The total number of light stations, lightships and fog-alarm stations in the Dominion is 838, and lights shown, 1,053; the number of steam whistles, fog-horns, bells and guns, 119; the number of lightkeepers and engineers of fog-alarms with masters of lightships is 883.

The report of the chief engineer relating to lighthouse construction, repairs, hydrographic surveys, &c., contains detailed information. The principal repairs, changes and improvements at existing stations are referred to in his report, also new aids to navigation. The work done at fog-alarm stations in connection with steam whistles, compressed air horns and explosives, is dealt with under the proper headings. Information is also given respecting the extent of repairs and some account of the repairs in detail under the head of the station.

During the past year 18 light stations were established in all, and 4 fog-alarms, 21 buildings were erected at existing stations and 7 fog-alarm buildings were erected at existing stations.

RIVER ST. LAWRENCE SHIP CHANNEL AND SOREL SHIPYARD.

The report of Mr. Cowie forms Appendix 12 of this report, and contains in detail information relating to the River St. Lawrence ship channel. This channel now extends from Montreal to Father Point, a total distance of about 325 miles. This has been divided, for the purposes of organization and details, into five divisions.

Division I., Montreal to Sorel:—It was recognized by the department that the improvement of the channel, through the shoal, opposite Longueuil, was of very great importance, and work was commenced at the beginning of the fiscal year, 1905. It was re-commenced in 1906, and almost completed at the end of the fiscal year. Although the work was of a very difficult nature, the progress made exceeded the estimates of the officers of the department.

In division II., from Sorel to Batiscan, the estimates of the officers were also exceeded, and most of the work completed at the close of the fiscal year, leaving several of the dredges available for work below Batiscan and at Cap à la Roche.

In division III., dredge No. 7 has been engaged on the 30-foot channel, through Lake St. Peter, and the channel through the lake is now completed. Of the 18 miles requiring dredging, nearly 6 miles is widened to from 450 to 650 feet. Next year the work of widening the channel will be continued with all possible vigour.

In division IV., from Batiscan to Quebec, tidal navigation can be used. At high tides there is an additional depth available of 3 feet at Batiscan, 4 feet at Cap a la Roche, 5 feet at Grondines, and about 10 feet at Ste. Croix and St. Nicholas at neap-tides.

The work in this district was concentrated on the non-tidal portion of the river until its completion. The 30-foot depth is available by taking advantage of high tide from Batiscan down.

The commencement of the important work, from Batiscan to Quebec, was made early in 1906, and some work at Cap à la Roche was begun.

Before the close of navigation, 1906, the 30-foot channel was completed from Montreal to Batiscan, so that navigation for that depth is now available, by taking advantage of high tide between Batiscan and Quebec, right up to Montreal.

Division V., Quebec to Father Point. The year 1906 has been an eventful one in the navigation of the St. Lawrence river, owing to the arrival of large steamers specially constructed for navigation between the ports of Montreal, Quebec and Great Britain. In order to make as much progress in the work of dredging the channel as possible, a European-built twin screw, sea-going, suction hopper dredge, built in 1904, was purchased for the sum of £30,000.

This dredge was placed at work at Beaujeu bank, 35 miles below Quebec, and before the close of navigation of 1906, an amount of about 100,000 cubic yards was removed from the channel opposite Crane island.

The season of 1906 was not only very successful, with regard to the progress of the improvements, but also for safe navigation.

The St. Lawrence, like all other waters of North America, has felt the effects of the exceedingly dry summer. The water has been lower than usual throughout the whole season, and for the months of September, October and November the large vessels were not able to load to their full capacity. The lowest depth reached was, however, 6 inches higher than the standard adopted for low water, or the low record of the year 1897, which was the lowest on record, except for the extraordinarily low water of 1895, which, for a few days, reached a stage 6 inches lower.

The usual sweeping of the channel was carried out, as well as all assistance given in the interest of navigation.

The total amount of dredging for the fiscal year amounted to 4,047,530 cubic yards, and the average cost 10½ cents per yard.

The Sorel shipyard has been fully occupied in the construction and repairs to dredges, tugs and steamers for the Department of Marine and Fisheries, Public Works Department and a steamer for use in Hudson Bay for the Mounted Police Department. Mr. G. J. Desbarats is director of the shipyard and his report forms Appendix No. 3 of this report.

The dredge *W. S. Fielding,* built at the Sorel shipyards for the Public Works Department, was finished in July last, and several vessels belonging to the dredging fleet of the same department were repaired during the year.

The steamer *Rouville* was built for the Mounted Police Department for use in Hudson Bay and launched on June 5 last.

For the Marine and Fisheries Department a sea-going hopper dredge is being built for use on the St. Lawrence river ship channel. The tug *Portneuf* for use with the dredging fleet of the ship channel was constructed; the *Jessie Hume,* for the same work, was extensively repaired and the hulls and machinery of the dredges and tugs of the ship channel fleet put in and maintained in good condition. This forms a large part of the work done at the Sorel shipyard.

The steamers *La Canadienne* and *De Levis* used in hydrographic work, were both repaired. The *La Canadienne* was partly rebuilt and made more suitable for the special work in which she is engaged.

The steamer *Verchères,* for lighthouse service of this department, was begun in January last and launched in August. Several vessels attached to lighthouse inspection and delivery work were repaired during the year.

Steel lighthouse towers were constructed in the shipyard, and repairs and alterations were made to other steel-lighthouse towers.

The *Arctic,* engaged in the Hudson Bay expedition work, was overhauled and repaired and materials furnished for her cruise.

The shipyard was much improved by the construction of a building of steel frames and brick walls, for use as a sub-station for electric power. The steam engines of the shipyard are not now used, as electric power has been substituted. A steel frame sawmill with wooden walls was erected, and this building is also used for the accommodation of the wood working machinery of the shipyard.

An extension was made to the blacksmith shop and forges were erected.

In addition to the above, electric motors, electric driven turbine pumps and a hydraulic machine were installed.

WRECKING PLANT.

Yearly subsidies of $10,000 are paid contractors who maintain wrecking plant, always available under contract to assist vessels which meet with marine accidents in certain divisions of Canadian waters.

The contracts at present existing are with Messrs. George Davie & Son, of Quebec, who keep the tug *Strathcona* and other plant in readiness to assist vessels that meet with marine accidents in the Lower St. Lawrence river. The subsidy of $10,000 was paid Messrs. Davie & Son for the year ending June 30, 1906.

The British Columbia Marine Railway Company are the contractors for maintaining the wrecking plant at Esquimalt, always available in the waters of British Columbia. This plant has been used during the past season, and succeeded in getting off the steamer *Mariechen,* which went ashore in False bay, Alaska, and was towed into Esquimalt for extensive repairs. The subsidy of $10,000 was paid the British Columbia Marine Railway Company for the year ending June 30, 1906.

Tenders were invited publicly for a wrecking plant to be stationed at North Sydney, in Cape Breton, to render assistance to vessels meeting with accidents in the waters of the maritime provinces and Gulf of St. Lawrence. The tenders are now under consideration.

LIST OF VESSELS SAFELY SALVED FROM JULY 1, 1905.

By Messrs. George Davie & Sons, in the Gulf and River St. Lawrence.

Str. *Pilot,* St. Antoine, July 1, 1905.
SS. *Aranmore,* Labrador Coast, July 1, 1905.
SS. *Unique,* St. Croix Bay, August, 1905.
SS. *Wastwater,* Anticosti, September, 1905.
SS. *Victorian,* Cap La Roche, September, 1905.
SS. *Virginian,* Crane Island, October, 1905.
Schr. *Tyree,* Rocky Bay, C.B., May, 1906.
SS. *Bray Head,* English Bay, May 1906.
SS. *Campana,* St. Valier, May, 1906.
SS. *Cervona,* Anticosti, July, 1906.
SS. *Kensington,* assisting Str. *Quebec* to Montreal, November, 1906.

SESSIONAL PAPER No. 21

SICK AND DISTRESSED MARINERS.

MARINE HOSPITALS.

Under the provisions of chapter 76, revised statutes, dues of two cents per ton register is levied on every vessel arriving in any port of the provinces of Quebec, Nova Scotia, New Brunswick, Prince Edward Island and British Columbia, the money thus collected forming the Sick Mariners' Fund. Vessels of the burden of 100 tons and less pay the duty once in each calendar year, and vessels of more than 100 tons, three times in each year.

By an amendment of this Act, passed at the session of parliament in 1887, 50-51 Victoria, chapter 40, it is provided that no vessel, not registered in Canada, and which is employed exclusively in fishing or on a fishing voyage, shall be subject to the payment of this duty.

The receipts for the fiscal year ended June 30, last, amounted to $60,281.82 less $97.92 refunds, making the net receipts $60,183.90, being an increase of $1,811.56, as compared with the previous year. The expenditure for the several provinces amounted to $50,120.42, a decrease of expenditure of $879.76 for the past fiscal year.

The receipts from the provinces of sick mariners' dues were as follows:—Nova Scotia, $19,229.08; New Brunswick, $11,698.48; Quebec, $16,982.02; British Columbia, $12,214.38 ; Prince Edward Island, $357.86. The Sick Mariners Act does not apply to Ontario, and consequently no dues are collected from vessels in that province.

In the province of Quebec the expenditure on account of sick seamen amounted to $9,072.35. The total collections for the entire province amounted to $16,982.02, being $327.56 less than the previous year.

At the port of Quebec, sick seamen are cared for at the Jeffrey Hale and the Hotel Dieu hospitals; a per diem allowance is made for each seaman for medical attendance and board.

At the port of Montreal, sick seamen are cared for at the General Hospital and at Notre Dame Hospital, under an arrangement made by the department, by which $1.20 per diem is paid for board and medical attendance of each seaman.

The expenditure on account of sick seamen, in the province of New Brunswick for the fiscal year, amounted to $10,449.42, and the collection of dues to $11,698.48, or $1,234.34 less than the previous year. Marine hospitals have been maintained at Miramichi, Richibucto and Bathurst.

In the province of Nova Scotia, marine hospitals are maintained at the ports of Louisburg, Yarmouth, Pictou, Sydney, Lunenburg and Point Tupper The total expenditure on account of sick seamen in the province of Nova Scotia, for the fiscal year amounted to $20,128.10, and the receipts to $19,239.48.

At Halifax, provision is made for the care of sick seamen, at the Victoria General Hospital, under arrangements made with the managers by which the sum of $1.20 per diem is allowed for board and medical attendance.

In the province of Prince Edward Island, the sum expended on account of sick seamen, during the fiscal year, was $1,776, and the receipts from sick mariners' dues, $359.86.

Sick seamen are cared for at the Charlottetown and Prince Edward Island hospitals, under arrangements made with the managers of these institutions.

In the province of British Columbia, the sum of $8,582.26 was expended for sick and disabled seamen, while the receipts from the collection of sick mariners' dues amounted to $12,214.38.

The marine hospital at Victoria has in attendance, a medical superintendent, with a salary of $300 per annum, and a keeper, whose salary is $500 per annum. He is also allowed a rate of $5 a week for board and attendance of each seaman.

At the ports where no hospitals are established, in the province of Quebec, Nova Scotia, New Brunswick, British Columbia and Prince Edward Island, sick seamen are cared for, under the chief officer of customs, when the vessel to which the seamen belong has paid the dues according to law. A circular to collectors of customs was issued February 7, 1891, permitting sick seamen to be attended at the port of arrival of a vessel, provided that the regular dues are previously paid at some port.

During the fiscal year the sum of $548.23 was expended for shipwrecked and distressed seamen, for which there was a parliamentary appropriation of $3,000.

The total expenditure on account of sick seamen and marine hospitals amounted to $50,120.42, including expenditure for printing and stationery, and the appropriation of parliament for the service was $50,000. The dues collected amounted to $60,183.90.

		Receipts.	Expenditure.
		$ cts.	$ cts.
For the fiscal year ended June 30,	1869	31,353 78	26,987 64
" "	1870	31,410 46	27,029 34
" "	1871	29,683 41	28,971 22
" "	1872	34,911 64	34,947 60
" "	1873	37,136 10	41,016 43
" "	1874	41,500 16	59,778 90
" "	1875	37,801 46	50,684 76
" "	1876	41,287 66	48,828 49
" "	1877	43,739 21	51,697 94
" "	1878	44,665 07	43,780 90
" "	1879	37,779 57	42,729 36
" "	1880	42,523 20	42,160 91
" "	1881	49,779 72	40,667 52
" "	1882	45,951 47	39,359 11
" "	1883	45,573 42	36,249 65
" "	1884	48,667 47	39,553 58
" "	1885	39,068 39	44,501 57
" "	1886	40,848 05	50,377 62
" "	1887	42,334 92	37,447 35
" "	1888	41,669 64	36,447 85
" "	1889	39,306 29	41,320 59
" "	1890	47,881 75	41,729 11
" "	1891	43,829 68	35,155 12
" "	1892	45,381 92	33,498 83
" "	1893	46,190 69	35,052 37
" "	1894	49,105 40	38,403 94
" "	1895	42,815 74	38,332 55
" "	1896	45,761 61	36,683 36
" "	1897	54,358 10	35,931 19
" "	1898	54,552 81	34,526 83
" "	1899	57,365 79	37,353 29
" "	1900	59,971 84	32,743 30
" "	1901	59,783 34	34,944 93
" "	1902	65,853 83	51,827 12
" "	1903	64,851 55	48,151 48
" "	1904	61,778 29	50,301 78
" "	1905	58,372 34	51,000 18
" "	1906	60,183 90	50,120 42
		1,765,019 27	1,558,249 93

MERCHANT SHIPPING.

The total number of vessels remaining on the registry books of the Dominion on December 31, 1905, including old and new vessels, sailing vessels, steamers and barges, was 7,325, measuring 669,825 tons register tonnage, being an increase of 173 vessels and a decrease of 13,013 tons register, as compared with 1904. The number of steamers on the registry books on the same date was 2,654, with a gross tonnage of 362,888 tons.

The number of vessels in the registry books of the Dominion on December 31, 1905, will appear in detail in supplement No. 1, of this report. The number of new vessels built and registered will also be shown, and a comparative statement of the tonnage of new vessels built and registered, from 1874 to 1905, both inclusive.

The statements showing the number of vessels and number of tons on the registry books at the different ports of registry, in the Dominion appears in the list of vessels published for the year ending December 31, 1905, and that for the year 1906 will appear in the next list of shipping.

STATEMENT showing the Tonnage of each of the Maritime States of the World, compiled from the Répertoire Général for 1904-5.

Nationality.	Steamers.	Gross Tonnage of Steamers.	Net Tonnage of Steamers.	Sailing Vessels.	Net Tonnage of Sailing Vessels.	Total Net Tonnage.
British	8,455	15,351,046	9,410,759	6,828	1,923,025	11,333,784
American	924	1,763,307	1,192,258	3,884	1,518,566	2,710,824
German	1,549	3,078,531	1,898,839	1,248	503,660	2,402,499
Norwegian	1,063	1,078,501	667,434	1,701	744,392	1,411,826
French	861	1,266,400	729,975	1,785	529,456	1,259,431
Russian	605	707,362	426,633	3,305	568,888	995,551
Italian	374	700,521	465,112	1,530	446,284	911,396
Japanese	654	865,447	549,815	1,337	166,757	716,572
Canadian	*	*	*	*	*	*
Swedish	771	582,043	406,081	1,598	271,940	678,021
Spanish	449	689,250	434,846	560	86,463	521,309
Dutch	415	662,148	415,742	666	90,608	506,350
Danish	440	536,643	326,563	995	127,911	454,474
Greek	198	333,901	208,791	887	167,560	376,351
Austrian	274	566,133	353,176	108	16,914	370,090
Turkish	114	101,632	63,210	881	178,355	241,565
Brazilian	209	148,139	93,345	342	74,535	167,880
Belgian	154	169,706	114,564	10	3,519	118,083
Argentine	131	89,298	55,561	162	40,627	96,188
Portuguese	44	51,728	32,243	269	53,681	85,924
Chilian	54	68,362	42,873	85	89,390	82,263
Uruguayan	28	21,238	13,220	72	31,062	44,282
Cuban	48	45,479	29,303	124	11,799	41,102
Chinese	33	56,892	36,404	8	925	37,329
Peruvian	4	8,456	5,283	35	25,039	30,322
Mexican	32	21,420	13,199	29	8,451	21,650
Roumanian	25	26,873	14,735	21	3,650	18,385
Egyptian	15	10,984	6,428	7	1,912	8,340
Nicaraguan	2	783	420	12	7,607	8,027
Montenegrin	.....	.....	.....	22	5,417	5,417
Venezuelan	9	3,936	2,096	22	3,168	5,264
Siamese	7	3,177	1,775	9	2,772	4,547
Haitian	5	1,790	908	13	2,280	3,188
Bulgarian	4	3,819	2,480	2	256	2,736
Guatemala	.....	.....	.....	10	2,512	2,512
Arabian	.....	.....	.....	3	2,484	2,484
Sarawak	4	3,597	2,261	.....	.....	2,261
Tunisian	1	2,115	1,333	4	665	1,998
Colombian	1	881	457	5	1,385	1,842
Honduras	3	2,506	1,572	2	199	1,771
Corean	4	2,430	1,731	.....	.....	1,731
Dominican	.....	.....	.....	9	1,338	1,338
Costa Rican	3	1,120	671	2	551	1,221
Liberian	.....	.....	.....	3	916	916
Perrian	2	1,328	885	.....	.....	885
Hawaiian	.....	.....	.....	4	804	804
Bolivian	.....	.....	.....	1	606	606
San Salvador	.....	.....	.....	3	514	514
Ecuador	.....	.....	.....	1	257	257
Zanzibar	1	350	235	.....	.....	235
Servian	1	264	102	.....	.....	102
Unknown	5	9,446	6,036	64	13,153	19,189
Total	17,975	29,038,582	18,029,384	28,668	7,682,253	25,711,637

* Included in British.

STEAMBOAT INSPECTION.

The total number of steamboats reported in the several districts in the Dominion, is 1,805, the gross tonnage being 325,982. Fees were collected for inspection amounting to $4,932.58; the fees from engineers for certificates amounted to $1,237.50, making the total receipts from steamboat inspection and engineers' certificates $6,170.08. The net receipts to the credit of the fund for the previous year amounted to $10,818.78.

The total expenditure in connection with inspection was $37,590.22. The decrease of expenditure for the last fiscal year was $25.09.

The consolidated laws relating to steamboat inspection came into force on the first day of January, 1889. The report of the chairman of the board of steamboat inspection forms appendix No. 5.

The following is a comparative statement of the receipts and expenditures in connection with steamboat inspection:—

	Receipts.	Expenditure.
	$ cts.	$ cts.
For the fiscal year ended June 30, 1870	12,521 29	7,379 18
" " 1871	10,369 96	8,321 00
" " 1872	11,710 43	8,500 00
" " 1873	15,412 75	11,205 54
" " 1874	15,603 19	10,291 58
" " 1875	15,011 90	12,199 81
" " 1876	13,811 24	13,081 86
" " 1877	15,858 42	12,073 01
" " 1878	12,431 25	13,228 28
" " 1879	12,331 16	13,076 46
" " 1880	15,424 02	11,854 34
" " 1881	16,905 49	12,211 65
" " 1882	15,277 78	14,835 97
" " 1883	12,577 36	16,209 02
" " 1884	15,371 79	21,893 28
" " 1885	13,343 66	23,235 04
" " 1886	14,087 76	21,775 57
" " 1887	12,701 20	22,837 80
" " 1888	12,550 14	21,430 45
" " 1889	12,576 18	22,313 03
" " 1890	19,859 18	20,989 52
" " 1891	21,644 72	22,183 76
" " 1892	20,994 84	22,736 59
" " 1893	25,295 35	24,386 95
" " 1894	24,835 47	25,961 36
" " 1895	24,630 56	26,385 88
" " 1896	24,002 32	26,321 27
" " 1897	25,094 95	26,837 83
" " 1898	31,525 40	26,342 29
" " 1899	33,854 45	28,035 49
" " 1900	36,474 83	27,965 92
" " 1901	34,967 37	29,247 59
" " 1902	38,458 92	27,493 80
" " 1903	28,888 09	30,172 09
" " 1904	10,818 78	33,723 12
" " 1905	6,170 08	37,615 31
" " 1906	4,604 40	37,590 22
	687,836 63	772,961 86

Owing to an amendment of the Steamboat Inspection Act of 1898, whereby fees for inspection of Dominion registered steamers were abrogated, there has been a falling off in receipts compared with those for the previous year, the fees as shown having been collected from steamers inspected but registered elsewhere than in Canada to the number of 142, having a gross tonnage of 144,180.

An Act to amend the Steamboat Inspection Act of 1898 was passed and assented to July 18, 1904; the following is a copy:—

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. Subsection 1 of section 6 of the Steamboat Inspection Act, 1898, is amended by adding thereto the following paragraph:—

(*g*) For the inspection of the machinery and equipment of steamboats propelled by gas, fluid, naphtha, electricity, or any other mechanical or chemical power, and in case of such vessels for making such changes in forms A and B of the second schedule hereto as he deems advisable.

NAMES OF INSPECTORS.

Name.	Position.	Address.
Edward Adams	Chairman of Board of Steamboat Inspection	Ottawa.
M. P. McElhinney	Inspector of Hulls and Equipment	"
I. J. Olive	" " "	St. John, N.B.
R. Hill	" " "	Halifax, N.S.
William Evans	" " "	Toronto, Ont.
M. R. Davis	" " "	Kingston.
Phillippe Duclos	" " "	Quebec.
John Dodds	Inspector of Boilers and Machinery	Toronto, Ont.
E. W. McKean	" " "	Collingwood, Ont.
J. B. Stewart	" " "	Toronto, Ont.
T. P. Thompson	" " "	Kingston, Ont.
Wm. Laurie	" " "	Montreal, Que.
L. Arpin	" " "	"
A. Rondeau	" " "	Sorel, Que.
J. Samson	" " "	Quebec, Que.
J. P. Esdaile	" " "	Halifax, N.S.
C. E. Dalton	" " "	St. John, N.B.
J. A. Thomson	" " "	Victoria, B.C.
G. P. Phillips	" " "	Kenora, Ont.
Frank M. Richardson	" " "	Vancouver.
C. T. Schmidt	Inspector of Dominion Steamers	Halifax.

INVESTIGATIONS INTO WRECKS.

Investigations were held into the causes of wrecks and other casualties in the river and gulf of St. Lawrence on the Atlantic coast, British Columbia coast, the Ottawa river and Lake Winnipeg.

There were sixteen investigations altogether; two into casualties in British Columbia, one in Lake Winnipeg, one on the Ottawa river, five on the Gulf and River St. Lawrence, and seven on the Atlantic coast.

The casualties up to the present time on the St. Lawrence route have been few, and these were of no great importance. The details of the investigations will be found in the report of Commander Spain, which forms appendix No. 13 to this report.

WIRELESS TELEGRAPHY.

There are thirteen stations in operation on the St. Lawrence route and the Atlantic seaboard for commercial purposes. Two more stations are now in course of construction; one at Father Point and the other at Clarke City (Seven Islands). As an aid to navigation, the wireless stations established by the government have been of the

greatest benefit, and on occasions there is no doubt that serious delays and probably accidents to ocean liners have been averted by the use of this system.

The steamers *Stanley* and *Minto* were employed during the season of navigation, in conveying men and material to the stations that were established during 1906, and these steamers are equipped for receiving wireless messages. The steamer *Lady Laurier,* engaged in the lighthouse and buoy service, Nova Scotia, has also been equipped in the same manner.

At some of the stations, numerous messages have been received, but the department has not yet completed arrangements for reporting the exact number transmitted or received at each station in connection with shipping.

The station buildings were erected and equipped under contract with the Marconi Wireless Telegraph Company, of Canada, and that company must transact its business under license from the Minister of Marine and Fisheries, with the consent of the Governor General in Council, as provided in the Canadian Statute 4-5 Edward VII., chap. 49.

The establishment of these stations has been of great assistance to shipping, as testified by managing owners of steamship lines. The report of wireless telegraphy forms appendix No. 14. The amount of expenditure for the fiscal year in connection with this service will be found in the statement of expenditure, Appendix No. 8.

SUBMARINE SIGNAL SERVICE.

The department is engaged in establishing electric submarine signal stations at Louisburg, Yarmouth, N.S., and Negro Head, N.B., and two submarine bells.

Two submarine signal bells have been established in the approach to Halifax harbour, for the use of vessels fitted with the necessary apparatus to receive such signals, as well as for vessels generally. The bells are each fitted to an iron tripod resting on the bottom, and one bell is sounded electrically through a submarine cable connection from the fog-alarm station at Chebucto head. The second bell is intended as a duplicate to be used should the other become inoperative. They are located two cables north 1° E. from the inner automatic gas and whistling buoy, and during thick or foggy weather there will be sounded on the bell, four strokes at intervals of 4½ seconds, followed by a silent interval of 6½ seconds.

A wooden building, fitted with the necessary electric apparatus, has been erected alongside the fog alarm station on Chebucto head, and the submarine cables connecting the bells therewith have been laid by the C.G.S. *Lady Laurier.*

CERTIFICATES TO MASTERS AND MATES.

During the year ended June 30, 1906, 12 masters, 17 mates and 28 second mates' seagoing certificates of competency; 250 masters' and 86 mates' coasting or inland certificates of competency; and 4 masters' coasting or inland certificates of service, were issued.

The total amount collected in fees from applicants for examination during the fiscal year ended June 30, 1906, was $5,526, and the amount expended on account of this service was $7,068.15, an excess of expenditure over receipts of $1,542.15.

The following statement shows the total receipts and expenditure on account of masters and mates since 1871:—

—	Expenditure.	Receipts.
	$ cts.	$ cts.
For the fiscal year ended June 30, 1871	1,410 45	
" " 1872	4,312 07	1,344 00
" " 1873	6,466 18	4,963 00
" " 1874	4,520 19	2,995 00
" " 1875	5,696 62	2,715 00
" " 1876	4,672 08	2,021 87
" " 1877	4,050 00	1,740 50
" " 1878	4,249 76	1,296 50
" " 1879	4,250 12	1,334 50
" " 1880	4,253 43	1,547 00
" " 1881	3,888 41	1,333 50
" " 1882	3,965 19	1,152 50
" " 1883	4,021 20	1,314 00
" " 1884	3,909 59	9,437 50
" " 1885	4,324 15	2,897 00
" " 1886	5,245 28	2,152 00
" " 1887	4,855 98	2,172 00
" " 1888	5,060 96	3,220 80
" " 1889	4,381 04	2,202 00
" " 1890	4,117 83	2,186 00
" " 1891	4,225 24	2,586 00
" " 1892	4,363 88	2,194 00
" " 1893	4,116 99	2,484 00
" " 1894	3,721 33	2,904 04
" " 1895	3,758 29	3,974 50
" " 1896	4,062 82	2,307 50
" " 1897	3,536 29	3,754 00
" " 1898	3,335 40	4,800 00
" " 1899	3,568 26	4,486 50
" " 1900	3,750 69	4,221 50
" " 1901	3,720 25	4,808 24
" " 1902	3,305 59	5,288 52
" " 1903	4,968 36	5,790 50
" " 1904	7,761 17	4,795 00
" " 1905	5,884 74	4,643 85
" " 1906	7,068 15	5,526 00
Expenditure	158,837 98	112,591 82
Receipts	112,591 82	
Excess of expenditure over receipts	46,246 16	

CORRESPONDENCE.

About 35,537 letters were received in the department during the fiscal year. The correspondence was carefully examined and replied to as far as necessary. About 18,000 letters were sent out during the same period. Forms, reports, circular letters and notices inviting tenders, are not included in the number of letters addressed to this department or sent out.

These forms, &c., are numerous and require special attention, as the matters to which they refer are important.

In the records branch of the department, the letters received are carefully examined, entered in the record book, placed on file, and the copy of the reply attached, so that the letters and answers can readily be seen and any subject easily followed up.

WINTER STEAMERS AND ROUTES.

The steamer *Stanley* took up the service between Summerside, P.E.I. and Cape Tormentine, N.B., on December 16, 1905, exactly the same date as she began the service in 1904. The steamer continued on the route with several interruptions of the round trips until January 10. From January 1 to 10 the trips were made with great difficulty on account of the quantity of heavy northern ice that drifted into the strait, filling Summerside Bay and Harbour. On January 9 the *Stanley* was from 7 a.m. until 4 p.m. making the trip from Summerside to Cape Tormentine. It was then decided to abandon this route and the *Stanley* left Cape Tormentine on January 10 for Georgetown, arriving at the latter place in the afternoon. The straits were found very full of sheet and drifted ice.

The steamer began to ply on the route between Georgetown and Pictou on January 11.

The steamers *Minto* and *Stanley* performed the service of crossing on alternate days, each steamer making tri-weekly trips. The trips between Georgetown and Pictou were continued until April 4, when the *Stanley* was taken off this route and put on between Charlottetown and Pictou and continued on that route until April 20, making tri-weekly trips with the *Minto* from Charlottetown to Pictou. The *Stanley* carried 3,128 tons of freight, 1,823 passengers, furnishing meals and berths to passengers. The earnings for freight amounted to $4,512.31, and that for passengers to $3,972.50, making the total earnings of the *Stanley* from December 16 to April 20, $8,484.81. On April 24 the *Stanley* entered into the service of placing automatic and other buoys.

'MONTCALM.'

The *Montcalm* was engaged in breaking the ice bridge at Cape Rouge. The weather remained fine during the greater part of the season. The accumulation of ice was not so great, nor was it so closely packed as during the previous winter, so the *Montcalm* made almost daily trips to what is called the ice bridge to break it. This gathering of the ice very often occurs at Cape Rouge, but the *Montcalm* succeeded in breaking it when it stopped, and this had the effect in many instances of keeping the river clear as far as Three Rivers.

The *Montcalm* was employed in making a trip to the Seven Islands on January 26, and another trip to the same place on March 21 without accident, showing the capacity of the steamer in keeping open navigation. The same steamer was sent to Gaspé in the month of April when the ice was nearly two feet thick, and opened the harbour to navigation. The *Montcalm* was also employed in breaking ice in the Saguenay river, and succeeded in going up the river for many miles.

'CHAMPLAIN.'

The *Champlain* is also an ice-breaking steamer and is employed in ferry service between Rivière Ouelle wharf, Cap-à-l'Aigle and St. Irénée and Murray Bay during the whole year. The steamer encounters very much ice during winter, and notwithstanding the difficulties and the liability of being carried out of her course by the large fields of ice passing, she managed to keep up the service remarkably well.

Over 9,000 passengers were carried in the year, the greater part, of course, during the summer months, and large quantities of freight and baggage.

The total receipts for the fiscal year amounted to $5,706.14.

'MINTO.'

The *Minto* was engaged from the 9th of December to carry goods to the Magdalen islands, the regular steamer *Lunenburg* having been wrecked. The steamer returned to Pictou and entered upon the winter service of carrying freight to Charlottetown, but did not enter upon the regular tri-weekly trips until the 27th of the same month. She continued on this route until January 8, 1906, when the steamer took up the service between Georgetown and Pictou in conjunction with the *Stanley,* making the tri-weekly trips between Georgetown and Pictou. The daily crossings were therefore effected between the two steamers; each steamer leaving on alternate days.

On March 3 an attempt was made by the captain of the steamer to go to Charlottetown, but the *Minto* did not succeed in reaching that port, owing to the heavy rafted ice and was compelled to return to Georgetown and continue the tri-weekly trips until March 24, when another effort was made to reach Charlottetown, but without success. The *Minto* had again to return to the Georgetown route and continued on that route until April 3, when this vessel succeeded in reaching Charlottetown and continued making tri-weekly trips between Charlottetown and Pictou until April 20.

The steamer was immediately engaged in departmental work after she had finished the winter service, until May 1, and then she was placed on the route between Charlottetown and Pictou, for a few days, to take the place of one of the Charlottetown Steam Navigation Co.'s boats and then entered upon the Marconi Wireless Telegraph service.

The *Minto* carried 3,517 tons of freight, 1,924 passengers. The earnings for the freight amounted to $5,405 and for carrying passengers, $4,813, making the total earnings $10,218.91.

'ARCTIC.'

The *Arctic* is also classed amongst the ice steamers as she was purchased for the Hudson bay expedition and has been engaged in that service.

The *Arctic* left Quebec on the 7th September, 1904, and returned to the same port October 6, 1905.

The machinery of the steamer had become injured and extensive repairs were made at the Sorel shipyard. This vessel was again sent to the Hudson bay on July 28, 1906.

ICE BOAT SERVICE BETWEEN CAPES TRAVERSE AND TORMENTINE.

Sixteen ice-boats were built during the year in connection with this service at a cost of $1,187, and some of the old boats repaired. The boat-houses at Cape Tormentine and Cape Traverse were also repaired and put in good condition.

The officers and the crews were selected and given instructions to be in readiness in case the ice boats should be required; but owing to the fact that the *Stanley* and the

Minto were able to make tri-weekly trips between Georgetown and Pictou throughout the winter, the ice boats were not called into requisition.

The expenditure for equipment and other charges in this service amounted to $3,297.75.

The keeping of the stations and boats in a good state of repair and equipment is necessary in case the winter steamers are prevented by ice from carrying the mails regularly. When the steamers are stopped the mails have, in the past, been carried by the small boats between the mainland and Prince Edward Island.

ILLUMINANTS AND ILLUMINATING APPARATUS.

Improvements in the coast lights have been made at important coast light stations by the substitution of modern dioptric quick flashing lights for the pattern formerly used. At Greenly island, in the strait of Belle isle, a second order light has been installed. The department has received a first order quick-flashing light for Heath point, Anticosti, in the Gulf of St. Lawrence, but it will be too late to erect it before next season.

A first order quick-flashing light is in process of erection at Sambro, Nova Scotia, and a third order light has been installed at Maugers' beach, Halifax harbour, and a fourth order light on Pictou island, all in Nova Scotia. A third order light has been installed at Point Macqureau, at the entrance to Bay Chaleur, and a similar order at Bryon island, in the Gulf of St. Lawrence, near Magdalen island, and fourth order lights at Cape Tryon, Seacow head and Cape Egmont, Prince Edward Island.

Several large automatic gas buoys have been placed off the coast of Nova Scotia, in the Bay of Fundy. These buoys replaced the old unlighted Courtny whistling buoys and are fitted to receive submarine bell attachments.

Signal service off Chebucto head, Halifax harbour, has been established and is in operation. The department is now engaged in placing electric submarine signal stations at Louisburg, Yarmouth, N.S., and Negro Head, N.B.

Arrangements have been completed for the erection of a hyper-radial single flashing light at Cape Race, Newfoundland. The tower has been built and the lantern is at the station and the apparatus to be placed in the light has arrived at Halifax, but owing to the lateness of the season it is not possible to install this light during the present year. It will, however, be put in operation as soon as practicable next season. So far as the department is aware this light carries the most powerful apparatus on the continent and it is expected to prove of the greatest benefit to navigation.

Petroleum has been largely used in the lighthouses as in former years. A more extended use of vapour gas has been made in the lighthouses and acetylene has been used in the gas buoys.

BUOYS AND BEACONS.

As usual the buoy service has received careful attention by the department, the numerous bays, inlets, rivers, lakes, harbours, and other navigable waters constantly require supervision and addition of aids to navigation.

The number of buoys has constantly increased, which, of course, requires increased expenditure. The expenditure for the year 1905-6 amounted to $121,834.61.

The districts now buoyed number about 365, and the buoys number about 4,200. A record of the names of the shoals, dangers, reefs and various points in channels, harbours, &c., where buoys are placed, is carefully kept; this enables the department to immediately locate the buoys when any reference is made to them in the correspondence.

The contract system has been found to work most economically, but not always as efficiently as desirable, owing to neglect on the part of some contractors to carry out the conditions of their contracts; in the majority of instances the contracts are immediately under the supervision of departmental officers, whose duty it is to report to the department any neglect of work on the part of the contractors. There are now about 200 contracts. These contracts are generally made for a period of three years. The contractors are paid semi-annually upon the certificate of the superintending officer. There are, however, some districts not under contract, the work being attended to by the harbour masters. In these cases it has been found more advantageous to place the work immediately in the hands of these officers.

A large number of whistling, gas, bell and other iron buoys are maintained along the coast of the several provinces, by Dominion steamers, particularly on the Nova Scotia, New Brunswick and British Columbia coast. These buoys are called coast buoys to distinguish them from harbour buoys. The cost of maintaining and placing by the steamers is not charged directly to the buoy service, but is included in the cost of maintenance of the steamers, which frequently perform the double duty of attending to lighthouses and the coast buoy service on the same trips.

The expenditure in connection with the buoy service for the year ended June 30, 1905-6, was as follows:—

Above Montreal	$ 11,469 52
Quebec	59,513 58
New Brunswick	13,564 34
Nova Scotia	22,479 73
Prince Edward Island	7,639 12
British Columbia	7,168 32
	$121,834 61

In addition to the buoys for marking dangers, gas buoys are maintained, showing in general, occulting lights, in the Quebec agency, 21; on the St. Lawrence river between Platon and Montreal, 51; between Montreal and Kingston, 37; in Pelee

passage, 2; at mouth of Detroit river, 1; at Port Colborne, 1; in Georgian bay, 4; at Port Arthur, 7; in Nova Scotia, 17; in New Brunswick, 7, and in Prince Edward Island, 1.

The coast buoy service maintained by the Dominion steamers on the coast of Nova Scotia, consists of 27 automatic whistling buoys, 4 gas buoys, 30 bell buoys and 172 steel can and conical buoys, 12 combined gas and whistling, 1 combined gas and bell. The changes were made by substituting 9 combined gas and whistling buoys for 9 Courtney whistling buoys and 3 combined whistling buoys were added to the number already in the water making the total, as above stated, 12 combined gas and whistling buoys.

In the New Brunswick agency there are maintained in the same way, 22 signal buoys, 21 steel can and conical buoys and 1 bell buoy, and 7 gas buoys. The signal coast buoys of Prince Edward Island number 6, and the steel can and conical buoys 6 and 1 gas buoy. In the province of Quebec there are 66 can and conical buoys, 1 bell buoy and 1 whistling buoy maintained by the Dominion steamers.

The steamer *Shamrock* is constantly employed in the buoy service, on the St. Lawrence river between Montreal and Quebec, and the steamer *Scout* between Montreal and Kingston; the latter steamer attends to the gas buoys above Montreal on the St. Lawrence river. The steamer *Druid* performs the buoy service below Quebec and attends to the gas buoys in the Quebec district.

The coast buoy service in British Columbia is performed by the Dominion steamer *Quadra*. There are 3 whistling, 2 bell buoys, 7 conical and 19 can buoys. The service at the mouth of the Fraser river is performed by the Public Works steamer *Samson*, employed for the buoy service by the department.

TIDAL AND CURRENT SURVEY.

Exceptional progress has been made in the Tidal Survey Branch during the past year, and the information added to the tide tables has been so large as to necessitate remodelling their form, and an important advance in the improvement of the accuracy of the tide tables has resulted.

An investigation of the currrents has been carried on under Dr. W. B. Dawson, engineer in charge of the survey, the region chosen being the Belle isle strait. The Dominion steamer *Gulnare* was employed, as well as the schooner *Laura*, which was chartered for the season. The observations were made continuously day and night, so far as weather permitted, and a continuous record of the tide for comparison with the current, was obtained at Forteau bay in the strait. The strait is considered almost equal in importance to the St. Lawrence, in the volume of traffic which it carries during the season of navigation, and this traffic is carried on by steamships. The only sailing vessels in the strait are schooners and fishing boats.

A detailed report on the movements of the currents in the Belle isle strait, is being prepared by Dr. Dawson, and the information which it will contain will be of important value to shipping. The tidal stations on the Atlantic and St. Lawrence coast have been maintained in continuous operation throughout the year.

Full tide tables are published for four of the principal stations on the eastern coast, viz.: Quebec, Father Point, Halifax, St. John, N.B., and tables giving the time of the tide only, for Charlottetown, Pictou, St. Paul Island and Yarmouth, N.S.

The tidal information for the St. Lawrence is now very comprehensive. For the Pacific coast, complete tide tables are published for Victoria, Sand Heads, in the Strait of Georgia, and Port Simpson. In all cases the tidal information published is based upon actual observation at the localities in question, and nearly all of these will be given in the tide tables for 1907.

The report of the chief engineer contains a summary of the work that has been done throughout the past season, and the report of Dr. Dawson in detail will be furnished in the supplement.

WHARFS.

The department has under its control a large number of wharfs in charge of wharfingers. These wharfs have from time to time been transferred to the department as they have been acquired by the government or built by the Public Works Department. Wharfingers, regularly appointed, collect tolls from vessels and owners of goods who use the wharfs. Some of the piers are breakwaters to afford shelter to vessels at which they are moored.

The most valuable wharf properties are connected with the agencies of the department. The King's wharf property at Quebec accommodates the departmental steamers, quarantine steamers and Public Works steamers. It was found necessary to increase the accommodation at Quebec, and the department leased from the harbour commissioners a very suitable wharf adjoining the King's wharf for a term of five years, at $1,200 per annum. The marine stores, machinery and blacksmith and carpenter shops are connected with the King's wharf. Large numbers of buoys, boats and other equipment and coal for use of the steamers, are stored on this wharf.

At Charlottetown extensive repairs have been made to the marine wharf during the year, and an extension of the railway track completed to enable freight to be delivered and taken directly from the winter steamers and loaded on board cars.

At Dartmouth, opposite Halifax, an extensive wharf property is owned and used for the steamers of the department and for the same purpose as at Quebec. The expenditure for the property and making it suitable has been considerable, but the outlay has been justified by the excellent accommodation which is now afforded the department for steamers, storing of supplies and spare articles used in connection with aids to navigation. A statement of wharfs and wharfingers forms Appendix No. 11.

LIFE-BOAT STATIONS.

There are 28 life-saving stations in the Dominion of Canada. Most of these have crews that drill two or three times a month. The men are paid $2 for each drill, and an extra sum is paid when any service is rendered to shipwrecked mariners.

At Long Point, Lake Erie, the men are permanently stationed during the months of September, October and November at the life-saving station, which is well equipped for their accommodation and that of those who may be rescued. The men receive $40 per month during the three months, and are paid for weekly drills during the other months of the season of navigation.

Toronto Island.—Captain Ward went to the rescue of the gasoline launch *Ogee.* The launch appears to have been left helpless in the lake, and a strong north wind was blowing her rapidly into the lake when Captain Ward and his two sons rowed to the launch and towed her to a place of safety.

The *Reuben Dowd,* a three masted sailing vessel went ashore on August 24. The accident was due to the rudder of the vessel becoming disabled. A high wind was blowing and a fairly high sea running. The vessel struck on the beach. The Toronto Life Saving crew under Captain Ward went to the rescue and landed all in safety on shore. The crew consisted of six men and one woman cook. The crew also went to the assistance of a dredge scow. The scow broke up and sunk in the channel. No lives were lost.

On August 8 Captain Ward went to the assistance of three young men in a yacht drifting into the lake. The rudder of the yacht was broken.

Long Point, Ont.—In the month of October, 1906, the life-boat crew went to the assistance of the iron steamer *Vulcan,* which had grounded, conveyed the men to Port Rowan and aboard again and stayed by the ship until she got off.

Cobourg, Ont.—One member of the life-boat crew, in August, 1906, went to the assistance of two young men, whose sail-boat had capsized in the lake opposite Cobourg, and brought them safely to shore.

Barker's Cove, Yarmouth, N.S.—The barque *Torrens* ran ashore on Sunday point in a thick fog in August, 1906, and the life-boat crew went to the vessel for the purpose of rendering assistance, but the vessel was towed off with tugs and the crew was not in danger.

Clark's Harbour, N.S.—The life-saving crew went to the assistance of the *Etolia* in June, 1906, at Cape Sable, and stood by the vessel for sixty hours, landing men and rendering other assistance.

Port Mouton, N.S.—In July, 1906, the life-saving crew assisted in taking off the crew of the steamer *Horo Prosgrund,* and landed them. They were engaged seven hours in doing this work.

Blanch, N.S.—The life-saving crew in June, 1906, went to the assistance of the wrecked steamer *Richard.*

LIFE-SAVING SERVICE IN BRITISH COLUMBIA.

The first step towards the inauguration of a life-saving service has been taken by the construction at Vancouver of a self-righting and self-bailing life-boat 35 feet long. A crew was organized in Victoria and drilled in the management of the boat.

The department is now considering the matter of establishing a life-saving station at Banfield Creek, with quarters for the crew, and also the matter of establishing life-saving crews at Clo-oose, Ucluelet and Clayoquet, where it is probable that crews can be engaged to man the boats. It has also been suggested that a life-boat be placed on board the wrecking steamer *Salvor;* this question is under consideration, and also the matter of providing a motor boat for the life-saving service.

The coast of Vancouver Island, between Port San Juan and Cape Beale is straight, and the cliffs high and bold. There are not any indentations or bays along the coast where stations can be established apart from those places mentioned.

A full report has been made on the subject and will be found in the Chief Engineer's report, which forms Appendix 1.

A list of the life-boats and stations of the Dominion forms Appendix 18 of this report.

SABLE ISLAND.

Owing to the isolated and peculiar position of Sable island, a report of the Superintendent of the island is published as an appendix to this report. Fortunately no wrecks or casualties occurred during the year and the boats and apparatus for life-saving have been used only for drills and the landing of supplies. The island is patrolled.

Cattle and horses are raised on the island and the increase among the wild horses during the past year has been above the average. There are now on the island 85 head of horned cattle, 35 trained horses, 2 stock stallions (imported), 6 stock mares (imported), and 200 wild ponies.

The number of people on the island is 42, including the superintendent and his family.

The report of the superintendent forms Appendix 17 of the report.

ICE-BREAKING IN THUNDER BAY.

In the autumn of 1904, the large harvest in the northwest was the cause of a congestion of freight at Port Arthur and Fort William, at which ports an enormous quantity of grain had been delivered from cars to be carried by water, east. The department undertook to keep the lights and other aids to navigation in the vicinity in operation and enable vessels to clear from these ports. It was also found necessary to break the ice near the wharfs and to keep it clear. The experiment was successful and the following season tenders were called for a more comprehensive system of ice-breaking in both harbours. Six or seven tugs, including a powerful ice-breaker, were employed in breaking ice and removing it out into the bay. The work was successfully carried out and navigation was kept open until December 15 without difficulty. The amount paid under this contract was $20,312.50.

In the spring of 1906 the harbours were again opened by means of an ice-breaking tug, at a cost of $3,800, and for the first time on record navigation in Thunder bay was open ahead of Duluth, in the United States.

The work has been especially under the control of Mr. B. H. Fraser, assistant engineer, and a full report will be found in the report of the Chief Engineer, appendix No. 1.

OIL FOR USE OF LIGHTHOUSES.

The department entered into a contract with the Canadian General Supply Company, Ltd., of Montreal, for supplying lighthouse oil for the season of 1906.

The specification upon which the contract was based required the oil to weigh, at 62° Fahr., not less than 7 lb. nor more than 8 lb. per gallon, and to withstand a flash test of 115° Fahr.

Oil was also purchased from New York, for use in the dioptric lights. The oil supplied was made according to a specification prepared by the American Lighthouse Board.

COASTING TRADE OF CANADA.

By the provisions of chapter 83, Consolidated Statutes of Canada, being an Act respecting the Coasting Trade of Canada, no goods or passengers can be carried by water from one port in Canada to another except in British ships, but the Governor in Council may from time to time declare that the Act shall not apply to ships or vessels of any foreign country in which British ships are admitted to the coasting trade of such country, and to carry goods and passengers from one port or place to another in such country, the parliament of Canada was empowered to pass the Act alluded to, under the provisions of the Imperial Act, 32 Vic., chapter 11, intituled: 'An Act to amend the law relating to the Coasting Trade and Merchant Shipping of British Possessions,' which came into operation in this country on its proclamation by the Governor General on October 23, 1869.

It was ascertained that the following countries, viz., Italy, Germany and Netherlands, Sweden and Norway, Austria-Hungary, Denmark, Belgium and the Argentine Republic allowed British ships or vessels to participate in their coasting trade on the same footing as their own national vessels:—the ships of Italy, by Order in Council of August 13, 1873; those of Germany, by Order in Council of May 14, 1874; those of the Netherlands, by Order in Council of September 9, 1874; those of Sweden and Norway, by Order in Council of November 5, 1874; those of Austro-Hungary, by Order in Council of June 1, 1876; those of Denmark, by Order in Council of January 25, 1877; those of Belgium, by Order in Council of September 30, 1879; and those of Argentine Republic, by Order in Council of May 18, 1881, were admitted to the coasting trade of Canada.

The following Act, entitled an Act respecting the Coasting Trade of Canada, was assented to May 15, 1902, and relates to the payment of duty on foreign-built British ships:—

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. In this Act, unless the context otherwise requires, the expression 'British Ships' means and includes all ships belonging wholly to persons qualified or entitled to

be owners of British ships, under the provisions of 'The Merchant Shipping Act, 1894,' and any other Act of Parliament of the United Kingdom in that behalf, in force for the time being.

(2) For all purposes of this Act the expression 'the coasting trade of Canada' shall be deemed to include the carriage by water of goods or passengers from one port or place in Canada to another port or place in Canada.

2. No foreign-built British ship, whether registered in Canada or elsewhere, shall be entitled to engage or take part in the coasting trade of Canada, unless such foreign-built British ship has first obtained a license for that purpose, which may be granted by the Minister of Customs.

(2) The Minister of Customs shall issue such license to any foreign-built British ship, whether registered in Canada or elsewhere, upon application therefor and upon the payment of a duty of twenty-five per cent ad valorem on the fair market value of the hull, rigging, machinery, boilers, furniture and appurtenances of such ship.

(3) This section shall not apply to any foreign-built British ship registered as a British ship prior ot the first day of September, 1902.

3. No goods or passengers shall be carired by water, from one port in Canada to another, except in British ships ; and if any goods or passengers are so carried, as aforesaid, contrary to this Act, the master of the ship or vessel so carrying them shall incur a penalty of four hundred dollars; and any goods so carried shall be forfeited, as smuggled; and such ship or vessel may be detained by the Collector of Customs, at any port or place to which such goods or passengers are brought, until such penalty is paid, or security for the payment thereof given to his satisfaction, and until such goods are delivered up to him, to be dealt with as goods forfeited under the provisions of the Customs Act.

4. The master of any steam vessel, not being a British ship, engaged, or having been engaged, in towing any ship, vessel or raft, from one port or place in Canada to another, except in case of distress, shall incur a penalty of four hundred dollars; and such steam vessel may be detained by the Collector of Customs at any port or place to or in which such ship, vessel or raft is towed, until such penalty is paid.

5. Penalties and forfeitures under this Act may be recovered and enforced in the manner provided by the Customs Act, with respect to penalties and forfeitures incurred under it, and as if imposed by it; and this Act shall accordingly be construed with reference to said Act, and as forming one Act with it, and all words and expressions in this Act shall have the same meaning as the like words and expressions in said Act.

6. The Governor in Council may, from time to time, declare that the foregoing provisions of this Act shall not apply to the ships or vessels of any foreign country in which British ships are admitted to the coasting trade of such country, and to carry goods and passengers from one part or place to another, in such country.

7. Where, by treaty made before the passing of 'The Merchant Shipping (Colonial) Act, 1869,' (that is to say before the thirteenth day of May, eighteen hundred and sixty-nine), Her late Majesty, Queen Victoria, agreed to grant to any ships of any foreign state any rights or privileges in respect of the coasting trade of Canada, those rights and privileges shall be enjoyed by those ships for so long as Her late Majesty agreed, or His Majesty the King may hereafter agree, to grant them.

8. Chapter 83 of the Revised Statutes is repealed.

LEGISLATION.

During the session of 1906, the following Acts were passed and assented to:—

An Act respecting the Harbour Commissioners of Montreal.

An Act respecting the powers of the Harbour Commissioners of Montreal.

An Act to provide for further advances to the Harbour Commissioners of Montreal.

An Act respecting the Harbour of North Sydney in Nova Scotia.

An Act respecting the Quebec Harbour Commissioners.

An Act to amend the Act respecting the Safety of Ships and the Prevention of Accidents on board thereof.

F. GOURDEAU, Lt.-Col.,
Deputy Minister of Marine and Fisheries.

DEPARTMENT OF MARINE AND FISHERIES,
OTTAWA, November, 1906.

APPENDIX No. 1.

ANNUAL REPORT OF THE CHIEF ENGINEER OF THE DEPARTMENT OF MARINE AND FISHERIES.

The Deputy Minister of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to submit a report of the work done in the several services under the supervision of this office during the seven months ended June 30, 1906, with some progress reports of work carried on to November 1, 1906.

This embraces work done at departmental headquarters on the construction of lighthouses, lightships and fog-alarms, the supervision of construction and repairs of lifeboats; the administration of the vote for the removal of wrecks and obstructions in navigable waters; tidal and current surveys; and the publication, examination and correction of hydrographic charts; construction of and repairs to fish hatcheries and refrigerators; engineering points in connection with the construction and maintenance of fish-passes; supervision of surveys of oyster beds; examination of applications for foreshore, wharf and other lots as they affect the interests of navigation; preparation and publication of notices to mariners and hydrographic notes, &c.

STAFF.

There is a special staff appointed for the tidal observation work; the remainder of the work of the branch is attended to by the general staff of the office.

The great increase in the amount lately voted for construction of aids to navigation has thrown upon this office a great rush of additional work. and to meet the increased demands it has been necessary largely to increase the staff and also to modify the system of doing work. For this purpose resident engineers have been appointed in connection with two of the agencies, and assistants from the headquarters staff have been frequently detached for special work in connection with large undertakings. I wish again to testify to the satisfactory work done by the technical staff, and once more to allude to the energy of Mr. B. H. Fraser, who has assumed direction of all fog alarm installations and experiments, besides being actively engaged in supervising all construction work.

The following changes have been made in my staff:—

Mr. J. H. Dubuc was on January 17, 1906, transferred to the staff of the government shipyard at Sorel.

Mr. H. J. Alward, employed all season on construction work in Ontario, was on October 25 transferred to the staff of the resident engineer at Halifax.

Mr. F. McDonnell has been employed almost continuously on outside work, installing fog alarm machinery at new stations.

Mr. J. F. Murphy has been employed since June 12, 1906, as assistant to the resident engineer in the Maritime provinces.

Mr. E. R. Beckworth resigned his appointment on August 30, 1906, to accept the position of city engineer of Kingston, Ont.

On January 16, 1903, Mr. G. R. Cosky was transferred to the Montreal agency of this department.

Mr. H. de Miffonis was appointed an assistant engineer on December 15, 1905, at a salary of $60 per month.

As foremen of works, the following have been employed:—

Mr. W. H. Brunel, exclusively on construction, and superintending ice-breaking operations, in Ontario, throughout the year; Mr. E. Corriveau, rebuilding lighthouses on the Ottawa river, during the summer season; Mr. M. J. Egan, since the opening navigation on construction work on L. Winnipeg and L. Ontario. Mr. F. Forster, only for a short time, making repairs to Lake Erie stations.

PERSONAL INSPECTIONS.

Personal inspections of construction work in progress have frequently been made during the year by Mr. Fraser and myself, and it is very desirable that such personal supervision of work should be extended as much as possible in the interests of efficiency. Examination of localities where work is proposed should always be made before the plans are prepared, and it is to be regretted, in the interests both of efficiency and economy, that the work, lately, has often been so much rushed as to prevent such preliminary inspections.

In April last, I was sent to British Columbia, with the special view of examining the west coast of Vancouver island, to report on precautions that could be taken to diminish the frequency of shipwrecks in that locality, and to improve facilities for rescue when future shipwrecks occur. I have made separate reports on new aids to navigation required, in compliance with which a firstrate lighthouse and fog-alarm station are now being erected on Pachena point, and the lighthouse board have considered and recommended further aids. A separate report on the need for a wireless telegraph installation was also submitted. I append hereto my reports on the need for a life-saving service, and on land communications.

REPORT ON LIFE-SAVING, WEST COAST VANCOUVER ISLAND.

OTTAWA, June 20, 1906.

To the Honourable
The Minister of Marine and Fisheries,
Ottawa.

SIR,—In accordance with your instructions, I made a very full inquiry into the possibility of improving the life-saving appliances on the west coast of Vancouver island.

As a preliminary to a discussion of the question it is desirable to draw attention to the very great natural difficulties to be overcome: difficulties that can scarcely be realized by any one who has not personally had experience of the shore to be protected. From port San Juan to Cape Beale, a distance of 35 nautical miles, the shore is almost perfectly straight, without a harbour or any place that a boat can land except in rare spots on the open shore under favourable conditions of weather. The rugged front of this stretch almost defies description. Rocky ledges rise abruptly into densely wooded mountains, with a tangle of underbrush that is practically impenetrable, and the shore line is cut by deep ravines that prevent progress along the shore; thus approach from landward as well as from seaward is practically impossible. West of Cape Beale is broken ground with hidden reefs in the entrance to Barkley sound, extending 15 miles farther. This forms the shore which vessels approaching the entrance to the Strait of Juan de Fuca meet almost at right angles. Winter gales, during the prevalence of which practically all the shipwrecks occur, are always southwesterly gales and blow almost directly on to the shore we are discussing, and when such gales prevail no small boat can either put off from the shore or make a landing on the shore throughout the whole stretch. Furthermore except for an Indian village at Clo-oose and for settlements inside of Barkley Sound there is hardly a living soul throughout the 50 miles of coast. I mention these points to indicate the initial difficulties in the discussion of any question of life-saving service.

The first step towards the inauguration of a life-saving service has been taken by the construction at Vancouver of a self-righting and self-bailing life-boat 35 feet long. In my opinion this boat must be supplemented by other boats of lighter construction, to be manned by smaller crews. A 35-foot life-boat is too heavy to be rowed to any great distance, and requires a crew of ten men and a coxswain. In the United States Life-saving Service no attempt is made to row these large boats. They are either towed to the scene of the wreck or are taken there under sail. In consequence of the fact that on the west coast of Vancouver island a boat must always work on a dead lee shore, sails would be of little use for this boat. She must depend on tow boats and oars, or, what I think would be far preferable, on a machine motor. Pending the completion of better arrangements I instructed Captain Gaudin, as per copy of letter herewith, to organize a crew in Victoria, and to have this crew drilled in the management of the boat.

Victoria is probably the only place where a crew of eleven men could conveniently be gathered. I think there will be no difficulty in securing men who have been trained in boating in the Royal Navy. Two good coxswains had already offered when I was in Victoria. If these men learn to use the boat efficiently she could be towed down the strait to where she may be wanted for service, or she could be established at Banfield creek with a regularly organized crew, as hereinafter recommended.

In the United States Life-saving Service and in our own Canadian service we have found the Beebe-McLellan surf-boat, of a light build and 26 feet long, self-bailing but not self-righting, manned by a crew of six men with a coxswain, to be far preferable for general service to a heavier boat, and in view of the conditions to be met in British Columbia, I would recommend the establishment of one of these Beebe-McLellan surf-boats at Clo-oose, one at Banfield creek and one at Ucluelet; with a fourth to be carried on the *Salvor* or on the *Quadra* if the *Salvor* is not available.

At Clo-oose there is an Indian village with a sand beach from which boats can be launched in moderate weather, and there are Indians there who are accustomed to face the rough waters of the Pacific in their dug-out canoes. I think a crew of six Indians, with a white coxswain to drill them and to take care of the station, might do efficient work, especially if the Indians were given a uniform and some little official recognition that would make them proud of the service.

At Banfield creek I should propose having a large life-saving station with quarters for the crew, and a regularly enrolled crew under an efficient coxswain to be kept there all winter; the coxswain to be left in charge of the station during the summer, when he could probably organize a volunteer crew from amongst the employees of the Pacific Telegraph line or local Indians. When this central station at Banfield creek is properly organized the life-boat now in Victoria should be removed to this place for permanent quarters.

At Ucluelet I should advocate the same arrangement as at Clo-oose.

The boat for the *Salvor* should be manned by the crew of the ship, who should be specially drilled in her management. The contractors to be paid for carrying this boat if the work is not covered by their present contract.

These suggestions I consider as preliminary arrangements, because I think that probably the most promising type of life-boat for this region would be a machine propelled boat, preferably equipped with a rather high powered naphtha engine. I have been making inquiries about these machine-propelled boats, and find that up to date they have been more or less experimental, and that difficulties have been encountered in fitting an engine that would fulfil the very difficult requirements of the life-saving service. The United States service have tried two or three boats of this type, and I should like authority to follow this matter up by visiting United States stations where there is a motor boat; and getting out a good design in collaboration with Mr. Newman.

If a suitable motor boat can be procured I should advocate establishing her at Banfield creek, where an absolutely sheltered harbour in a central locality can be had, and where the conditions seem most favourable for reaching probable wrecks in the shortest space of time.

If such a boat is established at Banfield creek I should advocate sending one of the other boat, already recommended for that station, to Clayoquot, where a crew could be organized under the same conditions as specified for Clo-oose.

With regard to line-throwing apparatus, the conditions are so absolutely unfavourable that I have little hope that any apparatus could be successfully used. The nature of the shore is such that no road can ever be built along it. This I have gone into at length, in my report on improvement of land communications, and I know no place along the 35 miles between Cape Beale and San Juan, where a line-throwing cart could be taken along the shore for a quarter of a mile. As a line must be thrown from a point immediately opposite the wreck, the conditions to be met are so difficult that I despair of any solution of the problem. However, for the sake of having the apparatus ready, in case a spot could be found from which a line could be thrown to a wreck, I recommend that two Lyle guns with complete sets of equipment be purchased, one set to be placed on the *Salvor* and the other set to be placed at Banfield Creek life-saving station. The crews in both cases to be trained in the use of the apparatus, and instructed to carry them, so that, if they could be landed where they would be available for throwing lines to wrecks, they might be used. Lyle guns, as used in our service and the United States service, are, in my opinion, preferable, for this work, to rockets.

The following is a synopsis of the above recommendations, with an estimate of the cost of the different items:—

ESTIMATE OF COST OF LIFE-SAVING SERVICE ON VANCOUVER ISLAND.

Service.	Construction.	Maintenance.
	$ cts.	$ cts.
At Victoria—		
35 ft. life boat built by Watts	600 00	760 00
Equipment for same	300 00	
Crew, coxswain	.....	
10 men	.....	
On "Salvor"—		
26 ft. surf boat	400 00	
Equipment of same	200 00	
Line throwing apparatus	650 00	
Crew, drill of men, &c	.....	200 00
At Clo-oose—		
26 ft. surf boat	400 00	
Equipment for same	200 00	
Boathouse, say	400 00	
Crew, coxswain for year	.....	500 00
6 men, 20 drills at $150	.....	180 00
At Banfield—		
26 ft. surf boat	400 00	
Equipment for same	200 00	
Line throwing apparatus	650 00	
Boathouse with living accommodation	2,000 00	
Motor life boat	2,000 00	
Equipment, say	300 00	
Crew, coxswain for year	.....	600 00
8 men for six months	.....	2,400 00
At Ucluelet—		
Same as Clo-oose	1,000 00	680 00
At Clayoquot—		
Boathouse, say	400 00	
Crew, same as Clo-oose	.....	680 00
Contingencies, inspection, &c	1,900 00	
Total	12,000 00	*6,000 00

*Annually.

The whole respectfully submitted.

WM. P. ANDERSON.

SESSIONAL PAPER No. 21

REPORT ON ROAD ON WEST COAST.

OTTAWA, June 20, 1906.

To the Honourable
The Minister of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to report the result of my investigations in British Columbia into the possibility of and necessity for establishing a wagon road along the shore from Port San Juan to Cape Beale, as advocated by the public in connection with the *Valencia* disaster, made in accordance with your orders.

In the first place I would point out that any one who advocates a road along this coast has never traversed it and can have no idea of the physical difficulties to be overcome. It is not too much to say that the construction of such a road is a practical impossibility, with any reasonable expenditure. Although the coast is approximately straight in its general direction, it must be remembered that the mountains of Vancouver island come down to the shore line, and what looks like even land from the deck of a vessel a mile out, proves, when one lands on it, to be cut up by ravines and hills, into a surface so uneven that it is impossible to build a road on it. The common error is to lose sight of the very large scale on which everything exists on that coast. The height of the hills, the size of the trees, the denseness of the underbrush, the depth of the ravines and the roughness of the rocks are all dwarfed by the large scale of the whole coast scheme, and it is only when one attempts to traverse the country on foot that one realizes the impossibility of contending with the gigantic difficulties encountered. I consulted the men having the most intimate practical knowledge of these conditions; the officials of the Pacific Cable Company, at Banfield Creek; Mr. Patterson, the lightkeeper at Cape Beale; Mr. Logan, the lineman on the government telegraph line at Clo-oose; the Messrs. Daykin, who helped to build the telegraph line and who have had twenty years experience on that shore; Mr. Joseph Williams, lineman at Port San Juan; the Rev. Mr. Ellison, who was at one time lineman on the telegraph line; Mr. Wm. Henderson, resident engineer of the public works at Victoria, and Mr. Brown, his assistant, who have charge of the telegraph line, and inspect it from time to time; Captain Gaudin, our agent, and Captain Walbran; and I can refer to all these authorities to endorse my opinion, that a roadway close to the shore is impracticable.

I am, however, of opinion that existing conditions can be improved. The trail that follows the government telegraph line from Port San Juan to Cape Beale is with difficulty passable by men on foot with the assistance of wire ladders down the sides of some of the worst ravines, and with the assistance of wire cables over some of the mountain torrents. In my opinion, this trail ought to be brought as close to the coast as practicable, throughout its length, and the improved line ought to be brushed out and cleared, so that ship-wrecked mariners could follow it easily to the nearest point where they could get relief, and roads should be cut from the main trail to the shore at intervals so that men cast ashore, could find their way. I doubt if the trail could be made available as a wagon road. I understand that the hills are too bad to admit of the use even of pack animals. Another difficulty is the fact, that the underbrush, consisting chiefly of sal-lal bushes, grows so rankly and so thickly that it is necessary to cut it every year to keep a trail open. As, however, such a trail is the only possible way of getting through the country, it seems very desirable that the present trail should be cut out and improved as much as possible.

For the purpose of watching the coast during the winter months, I would advocate at the shore ends of some of the roads cut from the main trail to the shore, the erection of huts, with a man established as a lookout in each of them, whose duty it would be to give warning of vessels in danger. These huts should be stationed on the most prominent headlands, and if located about six or seven miles apart they would command the whole shore line. Obviously these huts should be connected by telephone with Cape Beale or Port San Juan, and through them with Victoria. The lookouts could also

act as additional linemen, and should be supplied with provisions and clothing for the shipwrecked. I found a good deal of complaint about the present working of the government telegraph service. Some parties claim that the Canadian Pacific Railway Company, who now operate the Victoria office on the line, attend to this service only when they have nothing else to do, and that calls are neglected for hours at a time, further, that they do everything possible to divert business to their own line via Alberni to the prejudice of the government line. The neglect complained of is possibly dictated by this policy. I find, moreover, that the operators on the line are very strongly in favour of changing it from a telegraph line to a telephone line. They claim that when the line is grounded by the falling of a tree, as very frequently happens, a telephone message can be sent over when a telegraph message cannot pass. Mr. Keeley tells me that this statement is not scientifically correct. I am only giving the popular opinion locally expressed, which is unanimously in favour of making the line wholly a telephone line.

It seems evident that more money should be spent on this line to keep it efficient. It now costs over $6,000 per annum and produces practically no revenue. I think the expenditure on the line should be doubled if it is desired to make it efficient as an aid to navigation and a protection to life and property. I should advocate putting in telephones at the several additional stations I have suggested above, putting on additioinal linemen, and if necessary making the whole system independent of the Canadian Pacific Railroad telegraph service. I think that the extra expense involved should be charged to the Marine Department and not to the Government Telegraph Service, which now as a telegraph service fulfils the ends for which it was established.

I append a plan of the line from Port San Juan to Carmanah, showing additional stations recommended, showing changes in the location of the line suggested by the linemen and also a rough estimate of the cost of this work. This estimate, however, may require very marked revision.

ESTIMATE OF COST OF IMPROVING TELEGRAPH TRAIL, ESTABLISHING LOOKOUTS, ETC.

Diversion of trail from Port San Juan to Seven-Mile river ..	$ 600
Hut at or near Seven-Mile..	200
Improving trail to Carmanah..	100
Improving trail to Clo-oose..	100
Hut west of Indian village..	200
Hut west of Shelter light	200
Improving trail to Cape Beale..	200
Cutting roads to shore and underbrushing	500
Installing three extra telephones	300
Equipment for huts and incidentals..	800
Three extra men at $50 per month..	1,800
Estimate for this year..	$5,000

I also append for permanent reference the considerable correspondence I have had on the whole subject.

WM. P. ANDERSON,
Chief Engineer, Dept. of Marine and Fisheries.

OFFICE WORK.

A large proportion of the work done by the general staff of the branch consists in the construction, repair or improvement of light buildings, fog alarms, beacons and other aids to navigation. Full details of the work done in this connection during the past twelve months are contained in a separate report which is attached hereto. (Inclosure A.)

Plans and specifications for all important new buildings and repairs, new vessels, &c., are made or approved in this office.

The following table indicates the work done in the drafting office during the eleven months ended October 31, 1906:—

Description of work.	Plans designed.	Plans received.	Copies made.
Lighthouse towers and dwellings	34	22	133
Fog alarm buildings	8	.....	31
Detail sheets for above	20	13	84
Wharfs, piers, &c	6	6	7
Outbuildings	1	1	24
Buoys and apparatus	.....	.....	19
Machinery	1	37	7
Lanterns	1	4	1
Fish hatcheries	2	.....	2
Marine hospitals	.....	1	1
Steamers	.....	3	2
Land surveys	1	60	43
Charts under construction	1	.....	.....
Plans relating to foreshore	2	224	14
Miscellaneous	4	92	122
Total	81	463	490

Total plans for eleven months from December 1, 1905, to October 31, 1906	1,034
Charts received and recorded	160
Charts received and entered in chart books	16
Photographs received and recorded	211
Specifications written	32
Notices to mariners issued (comprising 332 subjects)	134

PUBLICATIONS.

The work of preparing and issuing notices to mariners continues to be heavy and urgent, during the past seven months 88 notices, covering 178 subjects, having been published. Amongst important notices, involving considerable labour in compilation, and representing useful work done in the department, are:—

An index to last year's notices ; hydrographic notes respecting uncharted dangers in Stuart and Trincomali channels; time of tide and slack water in the strait of Georgia; description of buoyage in Nicolet Traverse and Pointe du Lac; and buoyage at Blind River.

In the preparation of notices to mariners, I wish to testify to the faithful and accurate work done by Mr. J. M. O'Hanly, who assists in this branch of the routine work.

During the past seven months notices relating to waters outside of Canada were issued, covering 3 items relating to Newfoundland and the French islands, 2 items relating to the Atlantic, 4 to the inland, and 8 to the Pacific waters of the United States, as well as 10 notices referring to transatlantic, and 3 to transpacific, subjects. No attempt is made to issue a complete synopsis of British or foreign notices, but merely to republish items likely to be of immediate interest to Canadian vessels, or to vessels leaving Canadian ports for the more important or frequented foreign ports.

REMOVAL OF OBSTRUCTIONS.

During the past seven months the following work was done, under the annual appropriation for the removal of wrecks and obstructions:—

The wrecked barge *Tasmania,* which sank in the vicinity of Pelee island, Lake Erie, mentioned in last year's annual report, has been removed by contract, the owner having failed to do so. The contractors were the Midland Towing and Wrecking Co., of Midland, Ont., and the contract price, $3,900.

The owners of the schooner *Pearl* (which was sunk in the bed of the Shepody river, near Harvey, N.B., mentioned in last year's annual report), having failed to remove the obstruction, a contract was let for its removal to Mr. John P. Dunn, of Albert, N.B., the contract price being $1,000.

The schooner *Armenia,* sunk about three and a half miles from Pelee Passage lighthouse, Lake Erie, in May last, having been abandoned by the owners, a contract has been let to the Midland Towing and Wrecking Co., of Midland, Ont., for its removal, the contract price being $5,850.

The schooner *Ripple* was burned and sank in Port Bickerton, in November, 1905, and the owners failing to remove her, a contract was let to Messrs. Beazley Bros., of Halifax, N.S., to remove this obstruction, the contract price being $800.

HYDROGRAPHIC WORK.

The hydrographic surveys of this department are now in charge of Mr. W. J. Stewart, who will make a special report of the year's progress.

All hydrographic notes reaching the department are prepared for publication in this office, and embodied in notices to mariners.

In preparing notices to mariners, special attention has been paid to publishing all information obtainable respecting the hydrography of Canada, and the fullest possible sailing directions have been appended to all descriptions of aids to navigation, so as to increase the value of these notices. During the past seven months the following hydrographic notes were published:—

Affecting the Atlantic coast.—Notice of resumption of government target practice at McNab island, N.S.; sinking of schooner *Alexander R.* and subsequent raising of same near Reid Rock shoal, N.S.; wireless telegraph station established at Camperdown heights, N.S.; breaking up of wrecks of SS. *Damara* off Jeddore head, and schooner *Ida M. Schaffner,* off Isaac harbour, N.S.; and corrected position of buoy, Charlottetown harbour, P.E.I.

Gulf and River St. Lawrence.—Tidal and current survey steamer in Strait of Belle Isle; telegraph cable between Crane island wharf and the south shore; re-arrangement of bouyage between Nicolet Traverse and Pointe du Lac, P.Q.; and publication by the department of hydrographic charts, St. Lawrence river, No. 3 (Ile à l'Aigle to Ile Marie); No. 4 (Ile Marie to Ile Bouchard); No. 5 (Ile Bouchard to Ile St. Ours); and No. 6 (Ile St. Ours to Ile aux Foins).

Inland waters.—Hydrographic note concerning buoyage, &c., at Blind river; limit of rate of speed for vessels in Toronto harbour; and lighting of wreck of schooner *Armenia* sunk near Pelee passage.

Pacific coast.—Information respecting dangers in Stuart and Trincomali channels, supplied by Capt. J. F. Parry, R.N., of H.M.S. *Egeria;* information respecting time of slack water and tide in the Strait of Georgia; uncharted rock in Pender harbour, from information supplied by Capt. H. Newcomb, C.G.S. *Kestrel;* and establishment of fishing traps in Strait of Juan de Fuca.

TIDAL AND CURRENT SURVEY.

In this survey exceptional progress has been made in the tidal branch during the past year; and the information added to the tide tables has been so large as to necessitate remodelling their form.

As the C.G.S. *Gulnare* was used for the work of the hydrographic survey during the season of 1905, and the cost of its maintenance charged to that service, a substantial margin of the tidal service vote was left free, which has been expended on the reduction

of tidal record. Some part of the arrears has thus been overtaken, and an important advance in the improvement of the accuracy of the tide tables has resulted.

During the present season the investigation of the currents has been carried on, the region chosen being Belle Isle strait. Dr. W. B. Dawson, engineer in charge of the survey, gave his personal supervision to this work from May to September, assisted by Mr. S. C. Hayden, and two temporary assistants for the night work. The inspection and repair of the tidal stations on the Atlantic coast was entrusted to Mr. H. W. Jones; and the supervision of the tidal record to Mr. R. Angus, who also attended to the office work during the summer months, at headquarters in Ottawa.

Investigation of the currents.—In this the C.G.S. *Gulnare* was employed, as well as the schooner *Laura,* which was chartered for the season. This schooner was anchored by suitable moorings at a carefully selected point in the narrowest part of Belle Isle strait, the object being to ascertain the time of the turn of the current with relation to the tide. The observations were made continuously day and night, so far as weather permitted. A continuous record of the tide, for comparison with the current, was obtained at Forteau bay in the strait; from the permanent tidal station which has been in operation there for a number of years. With these arrangements it was hoped that the surveying steamer woud be free to investigate the more general problems which the current presents. The weather proved to be unusually broken, however, and the behaviour of the current was such that it was found necessary to confine the work of the steamer more specially to the central part of the strait, to obtain the class of information which is of most practical importance to shipping.

This strait is almost equal in importance to the St. Lawrence itself, in the volume of traffic which it carries during the season of navigation. It is also noteworthy that practically the whole traffic is now done by steamships, only one square rigged vessel being seen during the season. The only sailing vessels in the strait are schooners and fishing boats.

The observations made on the *Gulnare* were continuous day and night. There was considerable interruption, however, on account of the conditions met with. These were: (1) Very poor holding ground, the bottom of the strait consisting apparently of the smoothest rock throughout. (2) A sea rises very quickly when a wind springs up, as the depth of the strait is only 30 or 40 fathoms. (3) The weather was very changeable and uncertain during the season; although there were few really heavy gales. Consequently, in the strong currents and short choppy waves of the strait, the vessel would drag anchor as soon as the waves attained any strength, even with a large scope of hawser relatively to the depth.

Some time was lost because of bad weather in June, at the beginning of the season; and later the usual interruptions occurred in coaling and obtaining supplies. The amount of work done from the middle of June to the end of September was as follows, when the time is divided into even weeks, and one week is omitted in August for cleaning boilers:—

June 17 to 30—two weeks	225 hours.
July 1 to 28—four weeks	329 hours.
July 29 to September 1—four weeks	380 hours.
September 2 to 22—three weeks	139 hours

The number of days between these limiting dates is 78, with the omission of Sundays and the week referred to, and the total number of hours, day and night, is 1,872. The work done while at anchor, when the direction and strength of the current was measured every half hour, was thus 57 per cent of the total time at 24 hours to the day; which on the average is nearly equivalent to 14 hours per day of uninterrupted work.

It will not be necessary to enter here upon any description of the behaviour of the currents in Belle Isle strait, as a detailed report on this will be prepared. The

information resulting will be of important value to shipping. The results first ascertained when this survey was begun, are of great importance to mariners, as they disprove the incorrect idea which is still difficult to dispel, that the current runs constantly inward through Belle Isle strait towards the gulf. It is clear that such an error is very misleading to vessels, especially on the inward course in their recokoning to round Anticosti.

Tidal Stations and Tide Tables.—The principal tidal stations on the St. Lawrence and Atlantic coasts have been maintained in continuous operation throughout the year, and on the Pacific, six of the tidal stations recently established have been maintained. These are situated at points of the greatest strategic importance to obtain a comprehensive basis for the tides of the whole coast of British Columbia. From north to south they are: Port Simpson, Bella Bella, Wadhams, in Rivers inlet; Port Hardy, Vancouver, and Clayoquot on the west coast of Vancouver island. In addition to these tidal stations the turn of the current is being observed in three of the passes which are most used for navigation, namely, Active pass, Porlier pass and First narrows, at the mouth of Vancouver harbour.

A large quantity of additional information has been obtained from these observation and other sources, by which the tide tables have been extended and improved in accuracy. The tide tables have accordingly been remodelled, and for 1907 they are issued in two sets, instead of three as formerly. One of these comprises the whole of the eastern coasts of Canada, and the other the Pacific coast.

Tide Tables for the Eastern Coasts of Canada.—In these, full tide tables are published for four of the principal tidal stations, Quebec, Father Point, Halifax and St. John, N.B., and also tables giving the time of the tide only, for Charlottetown, Pictou, St. Paul island and Yarmouth, N.S. From these tables, tidal information for all other harbours of importance in Eastern Canada can be found by means of tidal differences. There is also an outline of the character of the currents on the lower St. Lawrence, in the Bay of Fundy, and around Newfoundland, with reference to the steamship routes which traverse those regions.

The tidal information for the St. Lawrence is now very comprehensive. The time at which the strong tidal currents turn throughout the estuary, is given with reference to Quebec or Father Point. In particular the time of high and low water in Beaujeu channel, which is the shallowest point below Quebec, is readily found by means of a tidal difference, which has been determined with care. For the ship channel above Quebec, special tide tables are prepared for the two points which are the shallowest at low water until the deepening of the channel is completed throughout. These points at present are St. Augustin bar and Cap à la Roche; and the tide tables prepared are issued by the Montreal Harbour Commissioners in their publication for the Pilot service.

Tide tables for the Pacific Coast.—By a prompt reduction of the tidal record obtained at Port Simpson, complete tide tables are issued for 1907. This is of special importance, as the time of slack water in Seymour narrows can be referred to that port with greater accuracy than to the distant harbour of Sitka. This advantage has been secured by making fresh reduction of the data for Seymour narrows which already existed. The time of slack water in the other navigable passes is similarly found from the other ports of reference.

Complete tide tables are now published for Victoria, Sand Heads in the Strait of Georgia, and Port Simpson. The tidal observations obtained by the Admiralty surveying steamer *Egeria,* since 1899, have afforded differences with these ports of reference for many localities in addition to those obtained by this survey. In all cases, the tidal information published is based upon actual observation at the localities in question, and nearly all of these given in the tide tables for 1907 are new. They are as follows: Referred to Sand Heads: New Westminster, Vancouver, Port Moody, Active Pass, Telegraph Harbour, Chemainus, Ladysmith, Porlier Pass, Gabriola Pass, Percy

anchorage, Dodd narrows, Nanaimo, Departure bay, Hammond bay, Nanoose, Union, Comox, Mitlenatch island off Cape Mudge and Quathiaska. Referred to Port Simpson: Nymphe Cove in Seymour narrows, two localities in Johnston strait, Alert bay, Blunden harbour, Port Hardy, Wadhams in Rivers inlet, Bella Bella and Lowe inlet.

Accuracy of the Tide tables.—The accuracy of tide tables is represented by the length of the tidal observations on which they are based. The following list thus shows in order of accuracy, the tide tables issued by this survey in their relation to tide tables published by the United States Coast survey for the more important harbours of the Atlantic and Pacific coast respectively.

Eastern coasts—

Halifax, N.S. Based on nine years of tidal observations.
Quebec. Based on eight years of tidal observations.
St. John, N.B. Based on eight years of tidal observations.
Sandy Hook. Based on eight years of tidal observations.
Father Point. Based on six years of tidal observations.
St. Paul island. Based on four years of tidal observations.
New York. Based on three years of tidal observations.
Philadelphia. Based on two years of tidal observations.
Boston. Based on one year of tidal observation.
Portland. Based on one year of tidal observation.

Pacific coast—

Sand Heads, Strait of Georgia. Based on six years of tidal observations.
San Francisco, California. Based on four years of tidal observations.
Victoria, Strait of Fuca. Based on three years of tidal observations.
Port Townsend, Puget Sound. Based on three years of tidal observations.
Astoria, Columbia river. Based on two years of tidal observations.
Port Simpson, Northern B.C. Based on two years of tidal observations.
Sitka, Banranof island, Alaska. Based on one year of tidal observation.

Tide levels.—The main object of this survey as a branch of the Marine Department is to deal with the time of the tide; since this is a matter of chief importance to navigation, and the question of levels is quite secondary. But the value of reliable levels, which can only be obtained from tidal observations, makes it seem right to take the additional trouble necessary to secure them. Such levels are essential in the construction of wharfs for dredging and other harbour improvements, and in city works.

In the cities of British Columbia, the levels were found to be in a state of confusion, and the problem of reducing them to a uniform basis in relation to the tide, was taken up when the coast was visited last season. The results have been published as a supplement to the last Annual Report of the Department.

The levels in the cities and towns of the Pacific coast are thus brought into orderly arrangement; and being referred to permanent bench-marks, they are always available for future reference. The places chiefly benefited by this work are Victoria, Esquimalt, Vancouver, New Westminster, Nanaimo and Port Simpson. The levels at the new tidal stations are also given, as well as a complete list of bench-marks established by the Admiralty surveyors as far north as Queen Charlotte sound, which serve to define the low-water datum of the charts in the surveys now concluded in that region.

ICE BREAKING IN THUNDER BAY.

In the autnmn of 1904, the large harvest in the Northwest necessitated an extra effort being made to relieve congestion of freight by forwarding as much as possible

of the enormous quantity of grain by water before navigation closed, and this department undertook to keep the lights and other aids to navigation in operation to the latest possible moment to facilitate this movement.

It was also found necessary to carry out a system of ice breaking in the ports of Fort William and Port Arthur, which, being near the most northerly limit of lake navigation, are in danger of becoming frozen over earlier than other points on the traffic routes. The experiment made at that time was so successful that the scope of the work was enlarged in the following season, and tenders were called for a comprehensive system of ice breaking in both harbours which would enable all boats to enter and leave and move freely to and from their berths without hindrance from ice. The lowest tender was accepted, namely, that of The Canadian Towing and Wrecking Company at $625 a day. The work necessitated the continuous employment of some six or seven tugs, including a powerful icebreaker, as, owing to the restricted area of these harbours, the ice had to be kept not only constantly broken but also removed in large quantities out into the bay so as to prevent regelation. The work was again successful, and Navigation was kept open until December 15 without difficulty. The amount paid under this contract was $20,312.50.

In the spring of 1906 the harbours were again opened by means of an ice breaking tug, at a cost of $3,800, and for the first time on record, navigation in Thunder bay was open ahead of Duluth. The results of this work have been so successful and the demands on the department for its continuance so many and so strong, that it is the intention to continue the work in future.

Respectfully submitted,

WM. P. ANDERSON.

OTTAWA, Ont., November 28, 1906.

(INCLOSURE A.)

DETAILED REPORT OF THE CHIEF ENGINEER OF THE DEPARTMENT OF MARINE AND FISHERIES ON CONSTRUCTION, ESTABLISHMENT AND IMPROVEMENT OF LIGHTHOUSES AND OTHER AIDS TO NAVIGATION UP TO JUNE 30, 1906.

To the Deputy Minister,
Department of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to submit a detailed report on work done in the construction and establishment of aids to navigation for the seven months ending June 30, 1906.

In submitting the following report of work carried on by the construction branch of this department, I would draw attention to the fact that the last report of this nature included all the work completed and under way at the close of November, 1905, The working season was then completed and practically full reports of all work done during the season were in the department with details of the cost.

Owing to the late rising of parliament this season, no money was available for construction of aids to navigation until very late, and it will be necessary to continue the work later than usual in order to get much of it completed. For this reason, particulars are not fully to hand yet, and as the fiscal year is to close on March 31 next instead of June 30, the present report will only cover such work as was completed or under way on June 30 last. A list, however, will be given of any additional important work that has been put in hand since that time, but all work now uncompleted will be taken up in the next annual report and the usual details given. Any statement of cost given in the present report, unless otherwise stated, will refer to the amount expended between November 30, 1905, and June 30, 1906.

NOVA SCOTIA.

NEW AIDS TO NAVIGATION.

Brier island.—A new fog alarm building is in course of construction at this station, and is nearing completion. The boilers are installed, tanks placed inside the building and other work completed.

The steam whistle maintained at this station will, as soon as the building is completed, be superseded by a diaphone operated by compressed air, which will give 3 blasts of 3 seconds each, with intervals of 4 seconds between them, in each minute.

The work is being carried on by day's labour, under the direction of Mr. S. Montgomery, and cost to June 30, $8,660.27.

Cranberry island.—A fog alarm was erected on the summit of the southern part of Cranberry island, and was put in operation on July 1, 1906. It is a square wooden building; the sides painted white and the roof red. The building stands about 1½ cables to the southward of the lighthouse and the old fog alarm building on the northern part of the island.

The fog alarm consists of a diaphone, operated by air compressed by oil engines, and gives during thick or foggy weather, one blast of seven seconds' duration every minute. The horn is elevated 29 feet above high water mark, and points S.S.E.

The work was done under the supervision of the Nova Scotia agency, and cost $3,213.15. The machinery was furnished under contract by the Canadian Fog Signal Company of Toronto, for $8,500.

CHANGES AND IMPROVEMENTS AT EXISTING STATIONS.

Mauger beach.—A new fog alarm building, erected at this station, is a square wooden building, painted white, with the roof red. The fog alarm was changed from the whistle formerly in use to a diaphone operated with air compressed by an oil engine. It gives one blast of 3½ seconds' duration every 30 seconds. The horn, elevated 37 feet above high water mark, projects from the south side of the lighthouse tower.

The work was done by day's labour, under the direction of the Nova Scotia agency, and the cost to June 30 amounted to $7,993.86. The fog alarm machinery was supplied by the Canadian Fog Signal Company, of Toronto, and cost $8,500.

McNab island.—The white, square wooden building, with a tower rising from the middle of its roof, from which the light on McNab island is shown, has had a red vertical stripe, five feet wide, painted down its seaward face from the lantern deck to the ground, to render it more conspicuous as a day mark when snow is on the ground.

Cape Race.—Both the fog alarm and lighting systems are undergoing extensive improvements, of which full details will be given in next year's annual report. The expenditure to June 30 was $940.

In addition to the above items, minor repairs were executed at the following stations:—

Chebucto head.—Repairs to dwelling and fog alarm, $1,020.32.

Betty island.—Repairs, $53.87.

Cross island.—New boat; and repairs to dwelling and fog alarm, $505.90.

Cape Fourchu.—Repairs to tower, $69.11.

Apple river.—Repairs to fog alarm, $176.64.

Egg island.—Repairs to boathouse and building, $54.16.

In addition to the above, the following construction work is under way:—
Cape Sable, a new fog alarm building and installation.
Little Hope, repairs to dwelling and breakwater.
Mauger beach, tower being raised and breakwater rebuilt.
Bear island, a new lighthouse and protection work.
Cape North, a new fog alarm.
Pictou island, a new lighthouse at the west end.
Harbour island, a new lighthouse under construction.
Jordan river, a lighthouse to be built on the breakwater.
Grand Digue, a tower built to replace a mast light.
Dartmouth, work done on departmental wharf and depot.
Sambro, alterations to tower.
Scatterie, repairs to the light and fog alarm station.
Amet island, breakwater repairs.
Pope harbour, repairs.
Louisburg, repairs.
Wedge island, repairs.
Port Bickerton, repairs.
Bird island, repairs.
Ouetique, repairs.
Cap La Ronde, repairs.
Port Hood, repairs.
Caribou, repairs.
Three Top island, repairs..

NEW BRUNSWICK.

CHANGES AND IMPROVEMENTS AT EXISTING STATIONS.

Quaco.—A new wooden dwelling, with stone foundation, was erected about 150 feet westward from this station, for the use of the engineer. It contains six rooms, cellar and cement reservoir. Repairs were made to the road, and the fog alarm machinery was overhauled.

The work was done by day's labour, under the supervision of the New Brunswick agency, and cost $2,280.

Partridge island.—The installation of the new fog alarm was completed. It consists of a diaphone, operated by air compressed by steam, and gives, during thick or foggy weather, through a resonator projecting from the southwest face of the building: two blasts each of 2½ seconds' duration every 30 seconds.

The work was done by the New Brunswick agency, and cost $6,076.80.

The water system installed on the island, in connection with the quarantine system, was extended to the fog alarm, the work being done by the Department of Public Works, at the cost of this department.

Long Eddy point.—This fog alarm was, on August 1 last, changed, to sound, during thick or foggy weather, two blasts, each of 2½ seconds' duration, every minute.

Passamaquoddy.—The lighthouse, on the east end of the eastern bar of Navy island, was moved 22 feet N., 47° E. from the steel pile foundation on which it was originally built on to a rectangular wooden cribwork pier, 54 feet long by 30 feet wide, and 23 feet high.

The crib was erected under the direction of the New Brunswick agency, and the total cost was $6,478.30.

Tiner point.—This fog alarm was, on April 1, 1906, changed so as to sound blasts of 3 seconds' duration every 45 seconds. The road leading from the public highway to the fog alarm station was also repaired at a cost of $100.

Richibucto harbour.—The range lights were shifted to suit a change in the channel across the bar, at a cost of $72.

Point Lepreau.—The fog alarm diaphone was changed to sound blasts of 3½ seconds, with intervals of 26½ seconds.

Goose lake.—Extensive protection work is being carried out at this station; 185 feet of new work, 5 feet high and 9 feet wide, was built, and the northeast end was extended a further length of 100 feet towards the south. Cost to June 30, $778.86.

Gannet rock.—General repairs are under way at this station. A new dwelling is in course of construction and the outbuildings are being improved. Cost to June 30, $2,630.12.

Letite.—A new protection work was erected at the station, consisting of square hemlock timbers, 240 feet long, 9 feet wide and 7 feet high, well bolted and filled with ballast stone; the seaward side being rip-rapped to a height of 4 feet. An addition is being put to the dwelling house and the water reservoir is being cleaned and repaired. Cost to June 30 is, $1,019.24.

Minor repairs were also executed at the following stations:—

Big Duck island, repairs to dwelling	$554 97
Cape Jourimain, repairs to dwelling	125 00
Grand Manan, repairs to fog alarm	662 88
Grindstone island, repairs to fog alarm	114 14
Head harbour, new boiler and fittings	802 59
Miscou, new boiler and fittings	1,091 33
Pokuesudie, new shed	109 70

In addition to the above the following works are now under way:—

Escuminac, an improved fog alarm building and machinery to be supplied.
Cocagne, range lights to be established.
St. Andrews, the foundation of the east lighthouse extensively repaired.
Head harbour, tower, dwelling and reservoir being repaired.
Partridge island, new dwelling built for the assistant keeper.
Big Duck island, reservoir provided.
Buctouche, repairs.
Miscou, repairs.
Machias Seal island, repairs.

PRINCE EDWARD ISLAND.

NEW AIDS TO NAVIGATION.

Georgetown.—A light was established on the roof of the coal shed on the outer end of the Georgetown railway wharf.

The light, which is fixed red, elevated 23 feet above high water mark, and visible two miles, is shown from a square wooden lantern, painted white, on the roof of the coal shed. The sides of the coal shed are painted red.

Souris.—An open steel skeleton tower, 25 feet high, fitted to take an octagonal lantern, 4 feet in diameter, constructed in the department's shipyard, at Sorel, was furnished for this station, and is in course of erection. The cost of constructing the tower was $650.

Indian point.—Extensive repairs are being made to the foundation.

CHANGES AND IMPROVEMENTS AT EXISTING STATIONS.

East point.—The fog alarm at this station was changed so as to sound one blast of 5 seconds' duration every minute.

Fish island.—An oil shed was erected at this station, the work being done by day's labour, at a cost of $175.

Brighton.—A new cribwork block foundation was started for the front range lighthouse at Brighton beach. The work is being carried out under the supervision of the agent of the department at Charlottetown, of which full details will appear in next year's annual report.

ONTARIO.

NEW AIDS TO NAVIGATION.

Long point.—The installation of the new fog alarm was completed and the plant put in operation. The building is a rectangular, wooden one, the sides painted white and the roof red. The alarm consists of a diaphone, operated by compressed air, and gives, during thick or foggy weather, through a horn projecting from the south face of the building, one blast of 3 seconds' duration every 30 seconds. The horn is elevated 20 feet above the level of the lake. This fog alarm replaces the steam horn heretofore used. Cost to June 30, $6,633.13.

Gravenhurst narrows.—A lighthouse tower was erected on the southeast point of Denison island, at the site of the old pole light, and the pole and shed were removed. The tower is an inclosed, square wooden building, with sloping sides, surmounted by a square, wooden lantern, the whole painted white. It is 27 feet high from its base to the top of the ventilator on the lantern, and rests on a masonry foundation 4 feet high. The light is a fixed white dioptric light of the sixth order, elevated 28 feet above the level of the lake, and visible seven miles from all points of approach by water.

The work was done under contract by Mr. G. Brown, of Bracebridge, Ontario, at a total cost of $701, the contract price being $650.

Kitchener island.—A light was established on the northwest extremity of Kitchener island. The light is a fixed white light, shown from an anchor lens lantern hoisted on a pole, which stands on land 1½ feet above the level of the lake and 130 feet back from the water's edge, and is elevated 40 feet above the level of the lake, and visible 11 miles.

The material for this light, together with the apparatus, was supplied from the Dominion Lighthouse Stores at Prescott.

Welcome islands.—A lighthouse was erected on the northeast extremity of the eastern Welcome island, and the light was put in operation on the opening of navigation in 1906. The lighthouse stands on land 80 feet above the level of the lake and 150 feet back from the water's edge. It consists of a square wooden dwelling, with an octagonal wooden lantern rising from the middle of its hip roof. It is painted white, with the roof red and is 38 feet high from its base to the top of the ventilator on the lantern. The light is a fixed white dioptric light of the seventh order, elevated 112 feet above the level of the lake, and visible 16 miles from all points of approach by water.

The work was done by day's labour under the direction of Mr. W. H. Brunel, the total cost being $4,657.39.

George island.—A lighthouse was established on the eastern extremity of George island, lake Winnipeg. The tower stands on land 6 feet above the level of the lake and 100 feet back from the water's edge. It consists of an open steel skeleton frame, square in plan, with sloping sides, painted red, surmounted by a wooden watchroom and an octagonal wooden lantern. The watchroom and the lantern are painted white. The tower is 64 feet high from its base to the top of the ventilator on the lantern. The keeper's dwelling stands 150 feet westward of the lighthouse. It is a rectangular wooden building, painted white. The light shown is a fixed white dioptric light of the seventh order, elevated 66 feet above the level of the lake, and visible 13 miles from all points of approach by water, except in the line of islands and shoals extending north westward from George island.

Tenders were first called for this work, and the lowest tender submitted was $4,900, but being considered too high, the work was, with steelwork provided in addition, carried out by day's labour, under the direction of Mr. M. J. Egan, and cost $3,128.10, exclusive of the steelwork, which was built in the government shipyards at Sorel, and cost $600.

In addition to the above, the following works are now under way:—

Arnprior, new lighthouse on concrete foundation pier.
Boyd island, breakwater.
False Ducks, duplicating fog alarm machinery and rebuilding dwelling.
Mississagi, replacing fog horn by diaphone.
Midland, new foundation to back range lighthouse.
Presqu'Ile, fog alarm and machinery.
Penetanguishene, lighthouse tower and crib rebuilt.
Sulphur island, lighthouse rebuilt.
Saugeen, foundation repaired and tower moved.
Red rock, breakwater rebuilt and repairs.
Burlington, repairs to foundation of front range light.
Black Bear island, repairs.
Gull harbour, repairs.
Point Pleasant, repairs.
Red river, repairs.

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Toronto.—A lighthouse tower was erected on the inner end of the east pier, eastern entrance to Toronto harbour on the site formerly occupied by an iron column and hexagonal shed, from which the back light of the eastern entrance range was shown, and which have been removed. The tower is an enclosed square wooden building, with sloping sides, surmounted by a square wooden lantern. The building is painted white and the lantern roof red. The tower is 22 feet high from its base to the top of the

ventilator on the lantern. The light is a fixed red dioptric light of the seventh order, elevated 27 feet above the level of the lake, and is visible six miles from all points of approach by water.

The work was carried out by the Department of Public Works and cost $914.79. The fog alarm machinery was overhauled and improved and a low pressure diaphone installed at a cost of $517.87, the diaphone being supplied by the Canadian Fog Signal Company of Toronto.

Port Colborne.—In connection with the extension and improvement of Port Colborne, it was necessary for the main lighthouse on the head of the old breakwater pier on the west side of the old entrance, to be taken down. To provide a light to replace this old main light, three electric arc lights, of 2,000 candle-power each, were established on the Grand Trunk Railway elevator, which stands on the east bank of the Welland canal, 1,200 feet south of the entrance lock. The lights are in a vertical line 3 feet apart, elevated 78, 81 and 84 feet respectively above the water, and are suspended from the wall of the elevator. They are 5,540 feet N. 17½° E. from the light on the end of the west breakwater, and with it mark the same alignment that was previously marked by the breakwater and main lights.

Collingwood harbour.—The lighthouse at the turn of the dredged channel in Collingwood harbour was removed to a new square cribwork pier, distant 191 feet N. 38° W. from the old pier, and 2,500 feet N. 50° W. from the northwest corner of the Grand Trunk Railway freight shed wharf. This light constitutes the front light common to two ranges, one range leading into the curve in the dredged channel, and the other leading from the curve of the dredged channel to the Grand Trunk Railway freight shed wharf. The tower is a square wooden building with sloping sides,, painted white, surmounted by a square wooden lantern painted red. The tower is 27 feet high from its base to the top of the ventilator on the lantern. The light is a fixed red dioptric light of the sixth order, elevated 29 feet above the level of the lake, and visible 7 miles in the aligment of the outer and inner ranges.

The back tower of the outer range stands on the mainland, 76 feet back from the water's edge, and 2,644 feet S. 4° W. from the front tower. The tower consists of a galvanized skeleton steel frame, square in plan, with sloping sides, surmounted by an inclosed wooden watch-room painted white, and a square wooden lantern painted white. The tower is 63 feet high from its base to the top of the ventilator on the lantern. The light is a fixed red catoptric light, elevated 58 feet above the level of the lake, and visible 8 miles in the line of range.

The back tower of the inner range stands on a square wooden cribwork pier, and is distant 1,530 feet N. 50° W. from the front tower. The tower is a square wooden building with sloping sides, surmounted by a square wooden lantern, the whole painted white. The tower is 39 feet high from its base to the top of the ventilator on the lantern. The light is a fixed white catoptric light. It is elevated 34 feet above the level of the lake, and is visible in the line of range. The character of the light shown from the lighthouse on the outer end of the western breakwater was changed from fixed red to fixed white, and was improved by the substitution of a fourth order dioptric illuminating apparatus for the catoptric apparatus formerly used.

The work was done by day's labour, under the direction of Mr. H. J. Alward, and cost $8,678.20, exclusive of the galvanized steel tower which was built by Messrs. Goold, Shapley & Muir, of Brantford, and cost $502.80.

Sault Ste. Marie.—The tower from which the back light of the Canadian Sault Ste. Marie canal lower entrance range is shown was moved back 206 feet in the line of range, and stands 1,356 feet N. 35½° W. from the front tower. The tower was increased in height by 10 feet, and is now 82 feet high.

Thunder cape.—The improvements at this station were continued and the fog alarm strengthened by the substitution of a diaphone, operated by compressed air, for

the steam horn formerly used. The diaphone, during thick or foggy weather, gives one blast of 3 seconds' duration every 30 seconds. An extension, 20 feet long, was built to the east side of the fog alarm building.

The work was done by day's labour, under the direction of Mr. W. H. Brunel, and cost $1,580.79.

AIDS TO NAVIGATION DISCONTINUED.

Blind river.—The range lights leading into Blind river, east of Susanne island, have been discontinued, being replaced by new lights farther west in the harbour.

Plunkett island.—The exhibition of the light from Plunkett island lighthouse, Lake Winnipeg, has been permanently discontinued, being replaced by the new light on Cox reef.

Salt point.—The exhibition of a light from Salt point lighthouse on the extremity of the sand spit at the entrance to Presqu'ile bay has been permanently discontinued.

Collingwood harbour.—The light shown from two lanterns on the same pole, on the shore in the south part of this harbour, 330 feet S. 17° W. from the northwest extremity of Fleming's wharf, constituting the front light of the old shore range, and the light shown from two lanterns on a pole, on the south side of Second street, constituting the back light of the old shore range, have been permanently discontinued, being replaced by the permanent range lights hereinbefore described.

MONTREAL AGENCY.

River St. Lawrence ship channel.—The work outlined in last year's report has been continued as follows:—

The various works mentioned in that report as being uncompleted have been gone on with and various new works undertaken as follows:—At Ile du Moine new range lights are in course of construction to lead between the channels marked by the Ile de Grace range and the range at Ste. Anne de Sorel. At Gallia bay four permanent lights are under construction; these will form two ranges to lead around the curve at Pointe aux Soldats. At Nicolet a permanent range is being established to lead from that point to the curve at Pointe du Lac front pier, and a new lighthouse is being erected on Boat island to lead in from Lake St. Peter in line with the high light on Ile du Moine. A new range is being erected at Gentilly, the front tower placed on the batture on a solid ice-breaking foundation.

Owing to the late sitting of parliament this work was very late in being begun this season, and consequently a comparatively small proportion of the vote was expended before the close of the fiscal year on June 30, 1906, the total amount being $51,373.92. In next year's annual report a full description of all this work, with detailed cost for the year, will be given.

The following important work was completed before June 30:—

Champlain.—On June 15, 1906, lights were shown from new range lighthouses, erected at Champlain, distant 50 feet to the southward of the alignment of the old range lights, and mark the axis of the ship channel from Champlain to Ile Bigot. The tower and the mast from which the old range lights were exhibited were removed.

The new front tower stands near the bank of the river, 158 feet N. 74½° E. from the old front tower, and about ⅛ mile above the village church. It is a square wooden building, surmounted by an octagonal wooden lantern, the whole painted white, and is 23 feet high from its base to the top of the ventilator on the lantern. The light is a fixed white catoptric light, elevated 34 feet above the summer level of the river, and visible four miles in the line of range.

The back tower stands 2,020 feet N. 56° E. from the front tower. It consists of an open steel framework, square in plan, with sloping sides, painted brown, surmounted by an inclosed wooden watchroom and a square wooden lantern. The upper portion of the framework facing the channel is covered with wooden slat work to render it more conspicuous as a day beacon. The lantern roof is painted red, the remainder of the lantern, the watchroom and the slats, are painted white. The tower is 92 feet high from its base to the top of the ventilator on the lantern. The light is a fixed white catoptric light, elevated 104 feet above the summer level of the river, and visible four miles in the line of range.

The steel tower for the back range was furnished by the government shipyards at Sorel, at a cost of $600, and the total cost of labour and material in erecting this range, exclusive of steel tower, was $890.47.

Cap Madeleine.—New towers were built for the lower range lights at this place, and the old range lighthouses taken down. The front lighthouse stands on the north shore, 400 feet back from the water's edge, 250 feet N. 83° W. from the site of the old front lighthouse, and 2½ miles below Cap Madeleine village church. It is a square wooden building, with sloping sides painted white, surmounted by an octagonal wooden lantern painted white with the roof red, and is 30 feet high from its base to the top of the ventilator on the lantern. The light is a fixed white catoptric light, elevated 51 feet above the summer level of the river, and visible 7 miles in line of range.

The back tower stands 2,880 feet N. 59° E. from the front lighthouse. It consists of an open steel framework, square in plan, with sloping sides, painted brown, surmounted by an inclosed wooden watchroom and a square wooden lantern. The side of the framework facing the channel is rendered more conspicuous as a day beacon by being covered half way down with wooden slatwork. The sides of the lantern, the watchroom and the slats are painted white, and the lantern roof red. The tower is 87 feet high from its base to the top of the ventilator on the lantern. The light is a fixed white catoptric light, elevated 108 feet above the summer level of the river, and visible 7 miles in the line of range.

This work was performed by day's labour, under the superintendence of the Montreal agency, and cost $3,863.90.

Port St. Francis.—The front light of this range was moved 15 feet to the northward of its present position, to mark the axis of the widened channel through Batture au Fer and Poullier Laforce. The axis of the range now bears S. 78° W.

Sorel.—New towers were provided for the range lights on the wharf at Sorel on the sites of the old towers. They are steel skeleton towers, square in plan, with sloping sides, surmounted by square iron lanterns, the whole painted red. The lights shown are fixed red catoptric gas lights, visible one mile in the line of range.

The front tower is 35 feet high from its base to the top of the ventilator on the lantern, and the light is elevated 43 feet above the summer level of the river. The back tower on the S.W. corner of the Richelieu company's wharf, is 50 feet high from its base to the top of the ventilator on the lantern, and the light is elevated 59 feet above summer level of the river.

The steel towers were supplied from the government shipyards at Sorel, at a cost of $600 each.

QUEBEC AGENCY.

NEW AIDS TO NAVIGATION.

Martin river.—The new fog alarm at this station was put in operation on August 10, 1906. The building stands 194 feet S. 70° E. from the old lighthouse, and 270 feet back from the water's edge. It is a rectangular wooden building with a high brick chimney and is painted red.

The fog alarm consists of a diaphone, operated by compressed air, and gives, during thick or foggy weather, one blast of five seconds duration every minute. The horn, elevated 70 feet above high water mark, projects from an extension at the north end of the fog alarm building and points N. 15° E.

A new lighthouse was also built near the site formerly occupied by the old lighthouse. It is an octagonal wooden building with sloping sides, surmounted by a circular iron lantern, the whole painted red, and is 63 feet high from its base to the vane on the lantern. The light is a flashing white light, showing four bright flashes of ½ second duration each, separated by eclipses of 4½ seconds, and followed by an eclipse of 14½ seconds ; the total period being 30 seconds. The light is elevated 130 feet above high water mark and visible 17 miles from all points of approach by water. The illuminating apparatus is dioptric of the third order, and the illuminant petroleum vapour burned under an incandescent mantle.

The completion of the installation was performed by day's labour and the cost was $4,395.

Anse aux Gascons.—A light was established on the outer end of the wharf at Anse aux Gascons. It is a fixed red light, shown from an anchor lens lantern hoisted on a pole, and elevated 29 feet above high water mark, being visible 7 miles from all points of approach by water.

The structure was built in the department's workshops at Quebec and erected by the crew of the C.G.S. *Montcalm* at a total cost of $80.60.

Belle Isle, north end.—The installation of the new fog alarm is being proceeded with, as well as the construction of the keeper's dwelling and other buildings.

The fog alarm building stands near the edge of the cliff at the north-east extremity of the island, and about 200 feet northeasterly from the light house tower. It is a rectangular wooden building painted red. The alarm consists of a diaphone, operated with air compressed by an oil engine, and gives, during thick or foggy weather, one blast of 3½ seconds' duration every minute. The horn, elevated about 90 feet above high water mark, projects from the northeast side of the fog alarm building and points N. 66° E.

This work was performed by day's labour under the supervision of the Quebec agency and cost to June 30 $1,545.71.

Natashkwan.—A lighthouse established in Little Natashkwan harbour was put in operation on July 1, 1906. The lighthouse stands on the west extremity of the island at the entrance to the harbour, replacing the beacon of skeleton steelwork formerly maintained there. It is a wooden tower, square in plan, with sloping sides, painted white, surmounted by a square wooden lantern, painted white, with roof red. It is 32 feet high from its base to the ventilator on the lantern. The light is a fixed white dioptric light of the seventh order, elevated 33 feet above high water mark and visible 11 miles from all points of approach.

The tower was erected by day's labour under the supervision of the Quebec agency and cost $1,578.

Cape Anguille.—A new fog alarm station is in course of construction at Cape Anguille, the lumber, iron, framing material, &c., being purchased and on the spot. The work will be done by day's labour under the direction of the Quebec agency and has cost to date $2,541.81.

Greenly island.—The work at this station was continued by day's labour, under the supervision of the Quebec agency, and cost to June 30, $2,196.28.

Seven islands.—A new fog alarm is in course of construction on Carousel island, Seven islands. The work is being done by the Quebec agency and the cost to June 30 was $5,366.

Rimouski.—A light was established on the roof of the freight shed on the wharf, near its outer end. It is a fixed white dioptric light of the sixth order, elevated 30 feet above high water mark and visible 10 miles from all points of approach by water. The light is distant 90 feet from the outer end of the wharf, and is shown from a square wooden lantern on the roof of the rectangular wooden freight shed; the walls and roof of the shed being painted dark red and the lantern white. The height from the top of the wharf to the top of the lantern is 21 feet.

The work was performed by day's labour and cost $105.31.

In addition to the above the following works are now under way—

Caribou river—A steel back range tower is being built.
Grosse Roche—A combined lighthouse tower and dwelling is being erected.
Port Daniel, west—A lighthouse tower is under construction.
Poste St. Martin—New range light towers are being built.
Portneuf—Extensive repairs to the dwelling.

CHANGES AND IMPROVEMENTS AT EXISTING STATIONS.

Macquereau point.—A lighthouse tower was erected on Macquereau point, on the site of the old lighthouse destroyed by fire on August 30, 1905. The tower is an octagonal wooden building, with sloping sides, painted white, surmounted by a circular iron lantern, painted red, and is 51 feet high from its base to the vane on the lantern. The light is a triple flashing white light, which shows groups of three bright flashes with intervals of 2½ seconds between flashes, followed by an eclipse of 10 seconds. The light is elevated 62 feet above high water mark, and is visible 13 miles from all points of approach by water. The illuminating apparatus is dioptric of the third order, and the illuminant petroleum vapour burned under an incandescent mantle.

A rectangular wooden dwelling, painted white, was erected near the lighthouse tower; a shelter shed was also built; and repairs made to the road.

The tower and dwelling were erected under contract by Mr. John Landry, of Gascons, Que., for $3,800; the total cost of the work being $4,545.05.

Cap Rosier.—The installation of the new diaphone fog signal plant, giving a blast of 7 seconds in every minute, was completed, and the alarm put in operation on August 1, 1906.

The work was done by Mr. Phillips, one of the department's erectors, the cost being $206.

Fame Point.—The fog alarm work at this station is being continued by day's labour under the supervision of the Quebec agency; the cost to June 30, being $3,587.

Cape Ray.—The steam fog horn was replaced by a diaphone operated by compressed air, which during thick or foggy weather gives one blast of five seconds duration every minute. The installation was completed, and the construction of a new dwelling begun; the cost to June 30 being $3,853.

Cape Bauld.—The installation of the new plant was proceeded with, and the alarm will be put in operation before the close of the season. The work is being performed by day's labour, under the supervision of the Quebec agency, and cost $914.

Bird rocks—The work of building a new landing at this station was completed, the total cost of labour and material (including cost of hoisting gear) amounting to $1,239. Steps are being taken to replace the existing explosive fog signal by a modern compressed air plant which can be sounded more frequently than the present alarm. This should be in operation next season.

Cape Norman.—The installation of the new fog alarm plant at this station has been continued, and the alarm will be put in operation on the opening of navigation next year. The work, which is being performed by day's labour, has cost to June 30, $437.

Amour Point.—The new fog alarm, mentioned in last year's annual report, was put in operation on the opening of navigation, this year. The building is of wood, rectangular, and the walls are painted white and the roof red. The horn elevatetd 40 feet above high water mark, points south and projects from the south end of the building. The alarm was changed from the whistle formerly in use, and consists of a diaphone, operated by compressed air. It gives, during thick or foggy weather, one blast of 7 seconds' duration every minute.

Anticosti (west end).—The protection work at this light station was thoroughly repaired, at a cost of $904.76, the work being done by day's labour, under direction of the Quebec agency.

Father Point.—A new generator house was built at this station by day's labour, the cost being $2,318.

Rivière du Moulin—New towers were built for these range lights. The towers are wooden buildings, square in plan, with sloping sides, surmounted by square wooden lanterns, the whole painted white. Each tower is 31 feet high from its base to the top of the ventilator on the lantern. The front tower stands in the alignment of the old towers, 200 feet N. 56° E. from the site of the old front tower. The light shown is a fixed white captoptric light, elevated 37 feet above high water mark, and visible two miles. The back tower stands 745 feet S. 56° W. from the front tower, and 145 feet back from the site of the old back tower, in the same line of range. The light shown is a fixed white catoptric light, elevated 79 feet above high water mark, and visible 2 miles in the line of range. The old towers have been taken down.

The work was done under contract by George Bergeron, of Chicoutimi, Que., the contract price being $800, and the total cost $1,005.17.

Upper Traverse.—The older portions of the sheathing are damaged every year by ice, and repairs were necessary. They were carried out by day's labour, at a cost of $1,282.56. Owing to the exposed position and swift current the work is difficult and costly.

Pointe â Basile—.Extensive repairs were made to the road at this station.The locality is extremely rough and the work correspondingly difficult. The cost was $1,445, and the work done by local labour, under the supervision of the Quebec agency.

Lightships.—On December 16 last the inspector of government steamers reported on the condition of the various lightships in the Quebec agency which were unfit to proceed to their stations without being thoroughly overhauled and repaired. This was carried out as follows :

Anticosti lightship No. 15—This lightship was furnished with over 100 new boiler tubes, and all leaking butts, rivets and seams were caulked ; the boilers were thoroughly cleaned and tested and painted with the best white zinc. The main stays were tightened up ; the gauge column mountings replaced by heavier ones ; the water tanks cleaned and cement washed, and all accessible portions of the hull in the engine room, stokehold, afterhold and chain locker painted with two coats of white zinc.

The cost of these repairs amounted to $3,168.38, the boiler tubes being supplied by Messrs. Robertson & Co., of Montreal. The work was done under the supervision of the inspector of government steamers.

Red Island Lightship.—A great deal of new tubing was supplied, the boilers were thoroughly scaled and all non-heating surfaces painted with the best imported white

zinc paint ; the timing engine was renewed ; the cylinder of pumping engine was bored out and piston rings renewed ; the slide valves of the winch were overhauled and adjusted and the water tanks repaired.

The cost of these repairs amounted to $1,141.13. The boiler tubes were supplied by Messrs Robertson & Sons, Ltd., of Montreal, and the work was carried out under the supervision of the inspector of government steamers.

Prince shoal lightship.—This vessel was scaled from stem to stem and painted with two coats of the best white zinc paint. A ballast tank in engine room was fitted to take the place of tanks in former use, and another ballast tank, 16 feet long, was provided aft, having connections to deck pump or boilers. The hull of the vessel was thoroughly repaired and all wood work removed from bulkhead to bulkhead, and frames renewed. The chain locker was scaled, and the boiler was tested and repaired. The windlass was put in first-class order and the heating plant thoroughly overhauled and renovated.

The cost of these repairs was $11,690.56, the work being done under the supervision of the inspector of government steamers.

White island lightship.—A new boiler and fittings were provided for this lightship, the boiler being provided by Mr. Alex. McKay, of Quebec, at a cost of $1,460. The cabin and crew's compartments were repaired and the lower deck and cabin sole planking was lifted and the vessel scaled throughout. A series of tanks, extending from bulkheads to bunker ends, were provided and the bulkhead renewed with ⅜ inch and 5-16 in. steel plates. In the after end of vessel the tank was extended forward and a substantial bulkhead built across vessel. A complete stokehold and engine floor was built of steel plating and the vessel was thoroughly painted inside and out and all defective shell rivets removed.

The repairs and alterations to the hull and fittings were carried out by Messrs. G. T. Davies & Sons, of Levis, P.Q., the whole of the work being under the supervision of the inspector of government steamers. The total cost of this work, inclusive of cost of boiler, was $13,927.

Minor repairs were executed at the following places :—

Cap au Saumon—Repairs to fog alarm buildings	$ 285 02
Entry island—Repairs to station	61 50
Isle aux Raisins—Repairs to lighthouse	46 00
Kamouraska—Repairs to lighthouse	201 75
Lark islet—Repairs to dwelling	512 00
Montee du Lac—New lantern head	200 60
Port Daniel—Repairs to lighthouse	31 25
Perroquets—Repairs to station	103 96
Pointe Riche—Smoke stack, &c	127 50
Red island—Repairing tower	201 03

AID TO NAVIGATION DISCONTINUED.

Baie St. Paul.—The fixed white light, exhibited from the wharf in the middle of the bay, was permanently discontinued on January 1, 1906.

BRITISH COLUMBIA.

NEW AIDS TO NAVIGATION.

Amphitrite point.—A light was established on the extremity of Amphitrite point. The light is a fixed white light, elevated 60 feet above high water mark, and visible 13 miles from all points of approach by water. The light is shown through a dioptric

lens from a 31-day three-wick Wigham lamp placed upon the summit of a small square wooden tower, painted white, standing on a wooden framework foundation, and is unwatched.

The cost of establishing this light was $141.54.

Swale Rock.—A light was established on Swale Rock. The light is a fixed white light, elevated 25 feet above high water mark, and visible 10 miles from all points of approach. The light is shown through a dioptric lens from a 31-day Wigham lamp placed upon the top of a small square inclosed wooden tower standing on a wooden framework foundation. The tower and the framework foundation are painted white. The light stands on the eastern end of Swale Rock, and is unwatched.

The cost of building the tower and installing the light was $303.

Berens Island.—A fog bell operated by machinery was established on Berens Island, replacing the fog bell rung by hand heretofore used. The fog bell tower is a square wooden building, painted white, surmounted by a bell. The fog bell is elevated 20 feet above high water mark, and gives, during thick or foggy weather, one stroke every 5 seconds.

The cost of installing the same was $173.

Sooke.—A light was established on the eastern extreme of Whiffen spit for the the convenience of small craft attending the fishing traps in Juan de Fuca strait. The light is a fixed white light, shown from a lamp suspended from the arm of a wooden pole. The light is elevated 18 feet above high water mark, and visible 5 miles, from all points of approach from seaward. It is unwatched and will be shown each year from March 1 to October 31.

Crofton.—For the guidance of vessels running to the Smelting Company's wharfs, a 31-day Wigham light was established on the southeasternmost of the Shoal islands forming the northern extremity of Osborn bay, and was put in operation on March 15, 1906. The light is fixed white, elevated 33 feet above high water mark, and visible 10 miles from all points of approach by water. The illuminating apparatus is dioptric of the seventh order. The lantern stands on top of a small square inclosed wooden tower, built on an open frame platform, 12 feet high, the whole painted white. It is maintained by the Britannia Smelting Company, and is unwatched.

The cost of erecting the tower and installing the light was $244.

Denman Island.—A lighthouse tower was erected on the reef on the west side of Denman island, about 1¼ miles to the southward of Village point, and was put in operation on July 1, 1906. The tower stands on the reef, 250 feet out from shore. It is a square wooden building with sloping sides, surmounted by a square wooden lantern, the whole painted white. It is 27 feet high from its base to the top of the ventilator on the lantern, and stands on a concrete foundation 12 feet high. A foot bridge connects the lighthouse with the shore. The light is a fixed white dioptric light of the sixth order, elevated 23 feet above high water mark, and visible 7 miles from all points of approach by water.

A beacon was erected on the outer edge of the reef, 200 feet S. 45° W. from the lighthouse, and consists of a pole with a latticework drum on top, painted white, rising out of a concrete foundation.

This work was performed by contract, the contractor being Mr. D. Menzies, of Vancouver, B.C. The contract price was $800, and the total cost $1,479.90.

Trial Island.—A lighthouse and fog alarm are in course of construction on the southern end of Trial island, and the amount expended to date has been $7,802.60.

Gallows Point.—A fog bell was established on Gallows point, Nanaimo harbour entrance. The fog bell tower is a square wooden building painted white, surmounted

by a bell; and the fog bell, elevated 20 feet above high water mark, is operated by machinery, which, during thick or foggy weather, gives one stroke every 5 seconds. The cost of establishing the same was $122.

Egg Island.—A fog alarm was established at this station. The building is a rectangular wooden structure, painted white with a red roof, and is situated about 100 feet north of the lighthouse, on the summit of the small islet on the west side of Egg island, on which the lighthouse stands. The fog alarm consists of a diaphone operated with air compressed by an oil engine. It gives, during thick or foggy weather, one blast of 5 seconds' duration every minute.

The work was performed by day's labour, under the superintendence of Mr. John Montgomery, and cost $7,170, exclusive of the machinery, which was furnished from the Canadian Fog Signal Company, of Toronto, at the contract price of $8,500.

Pulteney Point.—A hand fog horn was supplied to the lightkeeper at Pulteney point lighthouse, which will be sounded in thick weather in answer to the fog whistles of steamers.

Green Island.—The lighthouse mentioned in last year's annual report as being in course of construction at this place, has been completed at a total cost of $8,775.20.

Notice boards.—Notice boards, directing shipwrecked mariners and others to the nearest place where assistance is available, were placed in several places along the coast between Nootka island and Estevan point as follows : 4 in the vicinity of Nootka island, and 6 others along the coast in the vicinity of Estevan point.

In addition to the above the following works are now under way:

Cape Beale.—Rebuilding tower.
Kyuquot.—A harbour light is being established.
Quatsino.—A harbour light is being established.
Lucy island.—Dwelling and lighthouse.
Pachena point.—A new lighthouse and fog alarm are being erected.
Pine island.—A new lighthouse and fog alarm are being erected.
Porlier pass.—A dwelling has been authorized.
Virago rock.—A beacon has been authorized.

CHANGES AND IMPROVEMENTS AT EXISTING STATIONS.

Lennard island.—The fog alarm mentioned in last year's report as being under construction has been completed and work was done in making a safe landing for boats. All work was carried out under the superintendence of the British Columbia agency, and the total cost to June 30 was $13,606.98.

Brockton Point.—The dwelling house at this station was repaired, the chimneys reflashed and the exterior of the building renovated at a cost of $212.

Prospect Point.—An additional room to the dwelling house at this station was built and the roof repaired, the cost of which amounted to $242.85.

Carmanah.—The tramway at this station was repaired at a cost of $270 and one of the fog alarm boilers was patched and retubed at a cost of $480.

Fraser River.—Fraser river lightship, which broke away from her moorings on November 24, 1905, was replaced on her station on the Sand heads at the entrance to Fraser river. In addition to the light previously shown from the foremast head, a fixed white light is now shown from an anchor lens lantern at the mainmast head. Both lights are elevated 56 feet above the water and they are 29 feet apart.

Repairs were also made to the lightship, the garboards being recaulked, &c., the total cost of the above being $651.

Respectfully submitted,

WM. P. ANDERSON.

November 1, 1906.

APPENDIX No. 2.

ANNUAL REPORT OF THE COMMISSIONER OF LIGHTS, 1906.

To the Deputy Minister of Marine and Fisheries.

SIR,—I have the honour to submit the third report of this branch to December 30.

In the year which has passed, the department has partially carried out the general plan laid down for the improvement of aids to navigation, by the substitution of improved optical apparatus in the lighthouses.

In some of the more important lights in the Gulf of St. Lawrence and Atlantic seaboard, the older catoptric apparatus has been changed and dioptric quick flashing characteristic lights have been installed; and when the system is complete, all the important coast lights will have been altered and improved.

Work is in progress in connection with the installation of three electric submarine signal stations in Nova Scotia and New Brunswick; and the station at Chebucto head, Halifax harbour, has been in successful operation for some time.

In the gas buoy work of the department, the most notable points are the elimination of the burner trouble in the automatic gas buoys, by the use of a special purifier, and the general extension of the service.

Reference was made, in the last annual report, to the necessity for a regular inspection of the contract buoy service, by technical officers, and a plan has been submitted for such inspection, from time to time, with a view to seeing that all buoys are in their correct position, properly painted and maintained and up to the standard.

The large increase in the number of aids to navigation, during the past few years, has caused a severe tax on the department's facilities for maintenance and inspection and at the present time, in different agencies, it is necessary for the department to charter steamers to carry out the buoy and lighthouse work. Permanent facilities should be secured with the least possible delay, in order that the work may not suffer.

The following improvements and changes have been made in the lights during the past year :—

PROVINCE OF QUEBEC.

Bryan Island.—When the light at Bryon island was established in 1905, it was necessary to install a temporary illuminating apparatus. This was a group revolving catoptric light showing three bright flashes with intervals of fifteen seconds followed by an eclipse of thirty seconds.

In September, 1906, this temporary light was replaced by the permanent apparatus, consisting of a third order dioptric light and lantern, giving four bright flashes at intervals of five seconds between the greatest point of brilliancy, followed by an eclipse of fifteen seconds.

The illuminant is petroleum vapour burned under a mantle and the apparatus was supplied by Barbier, Benard & Turenne, Paris, France.

Point Macquereau, P.Q.—On August 29, 1905, the light station at Point Macquereau, Chaleur bay, was destroyed by fire. The character of the old light was alternating white and red, one minute, apparatus revolving catoptric. The new apparatus is dioptric of 375 mm. focal distance (between third and fourth order) triple flashing consisting of two groups of three lenticulor panels subtending 60 degrees each in the horizontal plane and 133 degrees in the vertical plane. In each semi-revolution of fifteen seconds the following flashes and eclipses are given, viz.:—

	Seconds.
1st flash	0·35
Short eclipse	2·15
2nd flash	0·35
Short eclipse	2·15
3rd flash	0·35
Long eclipse	9·65
	15 00

The new light went into operation on August 5, 1906.

The illuminant is petroleum vapour burned under a mantle and the apparatus was furnished by Barbier, Benard & Turenne of Paris, France.

Cape Norman, Straits of Belle Isle.—The department will, as soon as possible after the opening of navigation, 1907, erect at this station a segmental cast-iron tower, lantern and third order dioptric quick flashing light. The tower and apparatus are now at Quebec awaiting transportation to destination. The light will have the following characteristics, viz. :—

	Seconds.
1st flash	0·525
Short eclipse	5·475
2nd flash	0·525
Short eclipse	5·475
3rd flash	0·525
Long eclipse	17·475
One revolution each	30·000

The apparatus is of 500 mm. focal distance, consisting of 8 panels, each panel subtending 72 degrees in the horizontal plane and 136 degrees in the vertical plane with catadioptric reflector of 600 mm. focal distance subtending an angle of 144 degrees.

The illuminant is petroleum vapour burned under a mantle. The apparatus was made by Barbier, Benard & Turenne, Paris, France.

A double flashing light was procured for this station but owing to the necessity of making Cape Bauld a double flashing light the characteristic of Cape Norman was changed to triple flashing, utilizing for the purpose the 3rd order triple flashing apparatus procured for Seal Island, N.S., the original apparatus being shipped to Quebec for Matane.

Greenly Island, Straits of Belle Isle.—On July 9, 1906, a second order dioptric single quick-flashing light was put in operation at Greenly island, replacing a catoptric group revolving light.

The apparatus is of 700 m.m. focal distance, consisting of 8 panels, each panel subtending a horizontal angle of 45 degrees and a vertical angle of 131 degrees. A complete revolution is made in 20 seconds with the following characteristic:—

Flash	0·25	seconds.
Eclipse	2·25	"
	2·5	"

The illuminant is petroleum vapour burned under a mantle, and the apparatus was furnished by Chance Bros. & Co., Birmingham, England.

Heath Point, Anticosti.—As soon as possible after the opening of navigation in 1907 the department will complete the raising of the present tower at Heath Point and install a first order single quick-flashing light.

The apparatus, now at Quebec, is of 920 mm. focal distance, consists of two panels, each lens subtending a horizontal angle of 157 degrees and a vertical angle of 126 degrees. The lantern is 14 feet 1½ inches in diameter and the illuminant, petroleum vapour burned under a mantle.

The apparatus was constructed by Barbier, Benard & Turenne, Paris.

Cape Magdalen, P.Q.—A reinforced concrete tower is almost completed at this station to receive a third order triple flashing-light and lantern now at Quebec. This light should be in operation soon after the opening of navigation in 1907.

The apparatus will show a group of three flashes in every 30 seconds, and make a complete revolution in 30 seconds. In each period of 30 seconds the light will have the following characteristic:—

First flash	0·525	seconds.
Short eclipse	5·475	"
Second flash	0·525	"
Short eclipse	5·475	"
Third flash	0·525	"
Long eclipse	17·475	"
	30·000	"

The optical portion is of 500 mm. focal distance composed of a group of three panels, each panel subtending 72 degrees in the horizontal plane and 136 degrees in the vertical plane. A catadioptric mirror of 600 mm. focal distance subtends 144 degrees at the focus.

The illuminant will be petroleum vapour burned under a mantle. The apparatus was manufactured by Barbier, Bernard & Turenne, Paris.

Matane, P.Q.—A reinforced concrete tower is under construction at this station to receive a third order double flashing light now at Quebec awaiting erection.

It is expected that this tower will be completed and the light in operation early in the summer of 1907.

The apparatus will show a group of two flashes every 7½ seconds, and make a complete revolution in 30 seconds.

In each period of 7½ seconds the light will have the following characteristics:—

First flash	0·525	seconds.
Short eclipse	0·975	"
Second flash	0·525	"
Long eclipse	5·475	"
	7·500	"

The apparatus has a focal distance of 500 mm. composed of four groups of two panels each. The panels subtending 45 degrees in the horizontal plane and 136 degrees in the vertical plane.

The illuminant will be petroleum vapour burned under a mantle. The apparatus was constructed by Barbier, Benard & Turenne, Paris, France.

Métis, P.Q.—A reinforced concrete tower is under construction at this station to receive a third order triple flashing light similar to the light described for Cape Magdalen above. It is expected that this light will be in operation early in 1907.

Cape Anguille, P.Q.—A light at fog-alarm is under construction at this point, and a third order double flashing light similar in all respects to the light provided for Matane, P.Q., will be installed and the light should be in operation early in the summer of 1907.

Crane Island, P.Q.—The light at this station has been strengthened by substituting for the seventh order occulting lens light a fourth order lens light, with occulting screen operated by spring clockwork. The illuminant was changed from oil to petroleum vapour.

The new apparatus gives 10 seconds light and 5 seconds eclipse, and was manufactured by Chance Bros. & Co., Birmingham, England.

Bellechasse, P.Q.—This light was improved by the substitution of a petroleum vapour light for the oil lamp previously used.

Ste. Petronille, P.Q.—The white occulting gas light, seventh order, formerly exhibited at this station, has been replaced by a fourth order lens occulting screen, operated by clockwork. The illuminant is petroleum vapour burned under a mantle. The light is visible for 5 seconds and eclipsed for 3 seconds, alternately.

The apparatus was manufactured by Chance Bros. & Co., Birmingham, England.

PROVINCE OF NOVA SCOTIA.

Cape Race, Nfld.—A reinforced concrete tower has been constructed at this tation to carry a hyper-radial single flashing light and 17-foot lantern. The lantern has been delivered at the site, but owing to the lateness of the season the apparatus has been held at Halifax for erection in the spring of 1907.

The apparatus is single flashing of 1330 mm. focal distance consisting of four panels, each panel subtending a horizontal angle of 90 degrees and a vertical angle of 118½ degrees. The apparatus will make a complete revolution in 20 seconds and give the following characteristic:—

Flash	0·203 seconds.
Eclipse	4·797 "

The illuminant is petroleum vapour burned under an 85 mm. mantle. The lantern is 17 feet 1½ inches and the balustrade 24 feet in diameter.

Cape Race is one of the most important light stations maintained by Canada, and the hyper-radial light provided, when installed, will be the largest apparatus in any light station in North America. The candle power for a single flash is estimated at 1,000,000 candles.

The apparatus and lantern were constructed by Messrs. Chance Bros. & Co., Binmingham, England.

Sambro, N.S.—The tower at this station has been raised and a first order single flashing light erected, replacing a second order fixed light.

The apparatus is of 920 mm. focal distance, consisting of four panels of 90 degrees each in the horizontal plane and 126 degrees in the vertical plane. A complete revolution is made in 20 seconds, and in each period of 5 seconds the flash is 0·29 seconds.

The illuminant will be acetylene burned under a mantle.

The apparatus was constructed by Messrs. Barbier, Benard & Turenne, Paris, France.

Mauger's Beach, N.S.—The tower at this station has been raised ten feet and a third order dioptric quick flashing light and lantern installed, replacing a fifth order quick flashing light which was not found to be sufficiently powerful.

The apparatus is single flashing of 500 mm. focal distance, composed of 8 panels, each panel subtending 45 degrees in the horizontal plane and 136 degrees in the vertical plane.

In each period of 5·625 seconds the light has the following characteristic:—

Flash	0·787 seconds.
Eclipse	4·838 "
	5·625 "

The illuminant is petroleum vapour burned under a mantle, and the standby light acetylene.

The apparatus was constructed by Barbier, Benard & Turenne, Paris, France.

Pictou Island, East End.—The fixed white catoptric light at this station has been replaced by a fourth order single quick flashing light. The apparatus is of 250 mm. focal distance, and consists of 6 panels, each panel subtending 60 degrees in the horizontal and 144½ degrees in the vertical plane. In each period of five seconds the light has the following characteristic:—

Flash	0·957 seconds.
Eclipse	4·043 "
	5·000

One complete revolution in 30 seconds.

The illuminant is petroleum vapour burned under a mantle. The apparatus was made by Barbier, Benard & Turenne, Paris, France.

PROVINCE OF PRINCE EDWARD ISLAND.

Cape Egmont.—A single flashing fourth order light was installed at this station, replacing a fixed red catoptric light. This is similar in all respects to the light installed at Pictou Island, N.S.

Seacow Head.—The fixed white catoptric light exhibited at this station has been replaced by a fourth order double flashing light.

The apparatus of 250 mm. focal distance consists of two groups of two panels each, each panel subtending 90 degrees in the horizontal plane and 144½ degrees in the vertical plane.

In each period of 10 seconds the light gives the following characteristic:—

First flash	0·638 seconds.
Short eclipse	1·862 "
Second flash	0·638 "
Long eclipse	6·862 "
	10· "

One complete revolution in 20 seconds.

The illuminant is petroleum vapour burned under a mantle.

The apparatus was constructed by Barbier, Benard & Turenne, Paris, France.

Cape Tryon.—The temporary apparatus seventh order lens showing a fixed white light exhibited at this station has been replaced by a fourth order single flashing light.

The apparatus is of 250 mm. focal distance, composed of four lenticular panels subtending each 90 degrees in the horizontal and 144½ degrees in the vertical plane.

In each period of 5 seconds the light will have the following characteristic:—

Flash	0·638 seconds.
Eclipse	4·362 "
	5· "

One complete revolution in 20 seconds.

The illuminant is petroleum vapour burned under a mantle.

The apparatus was constructed by Barbier, Benard & Turenne, Paris, France.

PROVINCE OF BRITISH COLUMBIA.

Trial Island.—An apparatus, fourth order, dioptric double flashing, similar in all respects to that supplied for Seacow Head, P.E.I., has been sent to British Columbia for the Trial Island station.

Discovery Island.—The sixth order fixed light formerly exhibited at this station has been replaced by a fourth order lens light showing over 360 degrees of the horizon with occulting screen operated by clock-work. The light is visible for ten seconds and eclipsed for 5 seconds.

The apparatus was constructed by Chance Bros. & Co., Birmingham, England.

PROVINCE OF ONTARIO.

Gull Island, Lake Ontario.—The fixed white catoptric light consisting of a ring of eleven reflectors and lamps has been replaced by a fourth order lens light similar in all respects to the light supplied by Chance Bros. & Co., Birmingham, England, for the light at Discovery Island, B.C.

The following lighthouse apparatus has been supplied by the Dominion lighthouse depot, Prescott, for new lights or for the improvement of existing lights:—

PROVINCE OF NOVA SCOTIA.

Name of Station.	Order of lens.	Arc of visibility.	Remarks.
Guysborough Harbour	5th	270	
Port Bickerton	6th	360	
Musquodoboit Harbour light	6th	360	2 lenses.
Meteghan River	6th	360	
Belliveau Cove	6th	360	
Dear Island	6th	360	
McKenzie Point	6th	360	
Budget	6th	270	
Munroe Point	6th	270	
Cranberry Island	6th	270	Lower light.
Annapolis	6th	270	
Pictou Island wharf	6th	270	
Indian Harbour	6th	270	
Iona	6th	270	
Port Maitland	6th	270	
Caveau Point	6th	270	
Little Lorraine	6th	270	

PROVINCE OF NEW BRUNSWICK.

Big Shippigan	4th	270	
St. Andrews Bar	5th	360	

PROVINCE OF PRINCE EDWARD ISLAND.

Fish Island main light	4th	270	
Cascumpec	4th	270	
Souris, East, breakwater	6th	270	

PROVINCE OF QUEBEC.

Martin River	4th	240	Used as temporary light until erection of quick flashing light.
Ste. Petronille	4th	240	
Crane Island	4th	270	
St. Peter piers	5th	270	4 lenses.
Point Macquereau	5th	240	
Quebec, front and back lights	5th	90	
Natashquan	6th	360	Used as temporary light until installation of quick flashing light.
Rimouski wharf	6th	270	
Grosse Roche	6th	270	

PROVINCE OF ONTARIO.

Name of Station	Order of lens.	Arc of visibility.	Remarks.
Red Rock, George Bay	4th	360	
Western Islands Bay	4th	360	
Port Colborne	4th	270	
Slate Islands	4th	240	
Collingwood breakwater	4th	240	
Sulphur Island	5th	360	
Bruce Mines	5th	240	
Midland Point front light	5th	120	
Toronto East pier back light	6th	360	
Arnprior Island	6th	360	
L'Orignal	6th	360	
Allumette	6th	360	
Point aux Pins main light	6th	270	
Port Stanley	6th	270	
Collingwood shore range	6th	270	
Brebœuf front light	6th	270	
Port Dalhousie front light	6th	270	
Port Dover	6th	240	
Gravenhurst Narrows	6th	240	
Niagara-on-the-Lake lights	4th	240	2 annular lenses.

PROVINCE OF MANITOBA.

George Island	5th	260	
Cox Reef	5th	270	

PROVINCE OF BRITISH COLUMBIA.

Pine Island	5th	360	
Lucy Island	5th	270	
Denman Island	6th	270	

In each case where lenses were supplied the department also forwarded the necessary lamps, stores and usual accessories.

WIGHAM THIRTY-DAY OIL LIGHTS.

These lights are automatic oil lights which operate without attention for thirty days.

In the Wigham lights the wick burns horizontally passing slowly over a small roller, thus obtaining the light from the side and not from the end nor from the edge of the wick. The burner is surrounded by a combustion cone, and surrounded by lenticular apparatus; one end of the wick is conveyed up through an oil tight brass tube, receiving its supply of oil from the oil reservoir through holes in its sides, and the other end brought down through a tube standing above the level of the oil in the lamp, and soldered or secured at the lower end. A circular float is placed in a copper cylinder fixed to the bottom of the lamp, and filled with oil. When the lamp is first lighted this float is at the top of the cylinder, and is attached by means of hooks or loops to the wick. The oil in the cylinder is caused to drop slowly out of it through a valve of peculiar construction, supplied with a cotton core for filtering purposes, at such speed as may be necessary to cause the float to reach the bottom of the cylinder at the end of the period for which the lamp is intended to keep alight. The oil thus slowly descends within the cylinder, bringing with it the float and the wick which is attached to it. At the end of the month it is necessary to replenish the lamp with oil, and fit the new wick.

In certain of the narrow channels of British Columbia these light possess advantages and they have been established at the following points in that province during the past year, viz.:—

1. Amphitrite Point.
2. Crofton.
3. Coffin Island.
4. Danger Reef.
5. Nanaimo Harbour.
6. Walker Rock.
7. South Sand Heads.
8. Fraser River, North Arm.
9. Sechelt.

DOMINION LIGHTHOUSE DEPOT.

During the past year the water front of the department's property has been improved, but much delay has been experienced in obtaining timber and stone. Up to the present the main east and west cribs are in possession and partially filled while the cribwork on the eastern side of the property is completed with the exception of the outer block. Arrangements have been made for the rest of the timber required for the docks and for the hauling out ways and it is being delivered.

Lightship No. 1, Lake St. Louis, was thoroughly overhauled and replaced, lightship No. 2, in the lakes mentioned above, while the latter will receive repairs this winter, replacing in the spring No. 3 lightship which required attention.

A cast-iron cylindrical segmental tower was fitted at Prescott for Cape Norman, Newfoundland, and shipped to Quebec with apparatus and lantern ready for erection.

A similar tower is now being prepared for Cape Bauld, Newfoundland.

A continued gas and derrick scow is under construction for the Parry Sound agency. The scow is 100 x 30 x 6 feet and will carry a structural steel derrick capable of lifting twenty tons. The scow will be towed to Parry Sound and will carry on deck two No. 11 gas and whistling buoys for the Georgian Bay.

A list is given above of the lighthouse apparatus supplied to the various agencies by the lighthouse depot.

Prescott is also headquarters for the Montreal-Kingston buoy and lighthouse service.

Tests have been carried out with various petroleum vapour lights of different sizes and makes, and a report has been prepared by Mr. Allan Brebner, M. Inst. C.E., which will be available later.

The depot is in charge of Mr. W. H. Noble, Assistant Commissioner of Lights, and Mr. A. Boyle is accountant.

MONTREAL-KINGSTON DIVISION.

This division extends from Lachine, P.Q., to Ste. Anne de Bellevue, on the Ottawa river, and from Lachine to Nine-mile Point, and centre Brother light, Lake Ontario.

During the past season of navigation there were maintained 37 gas buoys, iron can buoys, spar buoys and lighthouses using compressed acetylene and lights burning oil.

At the close of navigation there were 20 shallow draft spar gas buoys, 1 deep draft spar gas buoy, 13 'Scout' type gas buoys and 3 number 7 automatic gas buoys in service.

The 'Scout' type buoys will be withdrawn as soon as possible.

The lighthouse at Burnt Island requiring extensive repairs was replaced by a steel storeholder bedded in concrete at base, surmounted by a structural steel lantern support and standard 200 mm. gas lantern. This makes a permanent structure, and eliminates the question of repairs.

There are now 4 gas lights of the type referred to in this division, viz.: St. Regis dyke (2), North Channel dyke and Burnt island.

In the past season of navigation the *Scout, Reserve,* derrick scow *Prescott* and gas compressing were in commission.

The service has been carried out to the satisfaction of the shipping interests, and no complaints were received.

PARRY SOUND AGENCY.

On April 23, 1906, an unfortunate accident occurred near Ten-mile Point during the charging of a Scout type gas buoy, which resulted in the death of Captain Arthur Clarke, and caused considerable damage to the contractor's tug and the department's apparatus.

A careful investigation was held, and it was found impossible to determine the ultimate pressure which the buoy in question was raised to. Instructions had been given that no higher pressure than 5 atmospheres was to be used in service. The Spruce Island gas buoy, which had previously been placed by Captain Clarke, had a pressure of 6 atmospheres, which caused an extra overload on the buoy of about 100 tons.

It is greatly to be regretted that no data was available to show the pressure to which the exploded buoy was raised. After the accident, all the high pressure buoys in the Parry Sound agency were replaced by such automatic low pressure buoys as were available. In some cases, No. 5 buoys were used, and these will be replaced by No. 8½ buoys.

NOVA SCOTIA AND NEW BRUNSWICK GAS BUOY SERVICES.

The Courtnay buoys along the coast of Nova Scotia and Bay of Fundy are being replaced as rapidly as the department's steamers can carry out the work, by No. 11 lighted whistling buoys. The repairs to the *Lady Laurier* which has kept her out of commission for some time, has delayed the placing of the buoys referred to.

St. John Harbour.—Gas buoys have been placed in the harbour replacing unlighted buoys. Five gas buoys No. 5 type have been placed in the Restigouche river, and two gas buoys No. 5 type have been placed in the Miramichi river.

(INCLOSURE B.)

LIST of Buoys maintained by the Department of Marine and Fisheries in Canadian Waters in 1906.

ONTARIO.

	No. of Buoys.
Amherstburg, including Bois Blanc....	44
Bay of Quinté (two contracts)..	19
Bears Rump..	1
Big Duck island, bell-buoy	1
Blind river..	4
Byng inlet..	7
Collingwood..	14
Clapperton channel..	9
Georgian bay..	13
" gas-buoys	4
Goderich..	6
Green shoal..	1
Grecian shoal..	1
Gananoque..	3
Hawkesbury..	10
Kaministiquia..	9
Lake Erie, gas-buoys..	2
Lake Nipissing..	32
Lake of the Woods, including bell-buoy.	115
Lake Simcoe..	12
Lake Superior, including bell-buoy.. ..	7
Little Current..	8
Lone rock, gas and bell-buoy..	1
Midland..	7
Murray canal and Presqu'ile bay... ..	23
Napanee..	14
Niagara, bell-buoy..	1
North Sisters rock..	4
Orillia..	9
Pancake shoal, bell-buoy..	1
Parry Sound..	27
Parry Sound, gas-buoys (one with bell)	3
Pembroke..	20
Pointe au Baril, beacons..	15
" buoys..	4
Penetanguishene..	10
Port Arthur, gas-buoys..	2
Port Rowan..	10
Port Colborne, gas-buoys..	1
Rainy river, beacons, pairs..	11
" buoys..	14
River Thames..	8
Rondeau..	6
St. Lawrence river, Montreal to Kingston, spars..	84
St. Lawrence river, Montreal to Kingston, Can-buoys..	13

LIST of Buoys maintained by the Department of Marine and Fisheries, &c.—*Continued.*

ONTARIO—*Continued.*

	No. of Buoys.
St. Lawrence river, Montreal to Kingston, gas-buoys	37
Ste. Placide, stakes and buoys	52
Sault Ste. Marie	20
" canal approaches	25
Seine river and Grassy lake, piles	30
" buoys	10
South Baymouth	4
Stokes bay	6
Surprise shoal, bell-buoy	1
Trenton	13
Victoria island, Lake Superior	3
Waubashene	37
Saugeen river	7
Sturgeon river	26

QUEBEC.

Agnes	1
Amherst harbour	8
Anse à Gascons	1
Anse à Beaufils	1
Barachois de Malbaie	1
Bonaventure	3
Cap Chat	1
Cape Cove	1
Cap Meule	1
Carleton point	1
Chicoutimi	15
Cock point	1
Chaudiere basin	7
English bay	3
Eschourie rock	1
Fox river	1
Gaspé	5
Grand Entry	14
Griffin cove	1
House harbour, Magdalen islands	6
Lake St. John—	
River Ashuapmuchuan	
" Mistassini	
" Peribonka	
Roberval harbour	
	110 and 25 beacons.
Little river west	1
Maria	1
Matane	3
Mont Louis	1
New Richmond	3
North channel, Island of Orleans	12
Nouvelle	1
Paspebiac	1
Pentecost	1
Percé	2
Port Daniel	1
Restigouche river	10
Richelieu river, balises	
" river, to St. Johns	35
" above St. Johns	19
Riviere à la Pipe, Lake St. John	8
" des Prairies	10
Ste. Adelaide de Pabos	1
Ste. Anne river	1
St. Thomas	8
St. Lawrence river, between Platon and Montreal, gas buoys	51
St. Lawrence river, between Platon and Montreal, unlighted buoys	214
Serpent reef	1
Maintained by Quebec agency, gas-buoys	21
Maintained by Quebec agency, unlighted buoys	66
Maintained by Quebec agency below Quebec, bell-buoy	1
Maintained by Quebec agency below Quebec, whistling-buoy	1
Petite Rivière East	1

NEW BRUNSWICK.

Bathurst	26
Baie Verte and Port Elgin	36
Bay du Vin	12
Beaver and Blacks harbour	9
Black brook, Miramichi river	6
Black Lands gully	12
Buctouche	22
" stakes	34
" river, bushes	200
Bartibogue	13
Campobello, 1 spindle and	9
Caraquet	21
Cocagne, stakes, 50	11
Dalhousie and Restigouche	12
Didgequash	5
Dipper harbour	3
Dorchester	3
Grande anse	4
Grand lake and Salmon river bushing	73
Grand Manan, 1 spindle and	28
Great Shemogue	7
Hatfield Point, bushes	
Harvey	7
Kouchibouguac and Black river, bushes	
Lepreau	3
Letite and Back bay, 1 spindle and	14
Little Shemogue, 1 beacon and	5
Little Shippigan	12
Magaguadavic	13
Maquapit and French lakes, 20 stakes and	4
Miramichi, 9 winter buoys, 1 lightship and	18
Musquash	7
Neguac	21
Neil harbour	1
Nappan river, 24 stakes and	3
North-west arm, Miramichi	14
Oromocto	7
Ox island, St. John river	5
Petit Rocher	2
Pisarinco	2

NEW BRUNSWICK—*Continued.*

	No. of Buoys.
Pokemouche	8
Richibucto and Albion	33
" Rexton and Browns yard	30
Shediac	18
" north of island, 26 bushes and	2
Shippigan, 17 pickets	20
St. Andrews	15
St. Croix ledge	11
St. John river, 155 stakes and	68
St. Louis, 15 bushes	10
South Tracadie Gully, 30 bushes	5
St. Simon, Bay Caraquet	4
Tabusintac	18
Tracadie, 150 bushes, North Gully	11
Tynemouth creek	3
Washademoak, 147 bushes and	2
Waweig river	1
West Isles, 4 spindles and	23
Maintained by agency—	
(gas buoys)	7
(can and conical buoys)	21
(whistling buoys)	10
(bell-buoys)	12
(bell boat)	1
(lightships	2

PRINCE EDWARD ISLAND.

Bay Fortune	3
Beach point	3
Bedeque	11
Brae harbour	5
Brudenell river	4
Cardigan, Lower	6
" Upper	12
Cascumpec, 12 stakes	14
Charlottetown, 20 stakes	22
Cove head	2
Crapaud, stakes and	5
East river (Hillsboro')	17
Egmont bay	12
" south, 8 stakes and	2
Georgetown	13
Goose harbour	2
Grand river, 1 beacon and	12
" lot 14	8
Indian rocks	1
Malpeque	16
Miminegash	6
Little channel	3
Montague	6
Murray harbour, 2 stakes	37
New London	9
Orwell and Vernon river, 36 bushes	6
Pinette	5
Port Hill	12
Pownal	7
Rollo bay	3
Rustico	5
Savage harbour	2
Souris	4
St. Peters harbour	10
Summerside	11
Tracadie	3
West point	2
Wood island	3
Maintained by agency..(signal buoys)	6
" " (can and conical)	6
" " (gas buoys)	3
including Zephir Rock.	

NOVA SCOTIA.

Advocate harbour	6
Apple river	8
Arichat	21
Argyle river and sound	10
Avon river	6
Barrington	32
Bear river	12
Beaver harbour	8
Blandford	5
Bridgewater	10
Canning or Habitant river..(6 dolphins)	
Canso and St. Andrews passage	30
Cape Negro or North-east harbour	17
Cariboo	6
Chester	25
Cheticamp	12
Chezzetcook and Petpiswick	6
Christmas island and Barra strait	11
Clarks Cove, West bay	3
Clarks harbour	17
Cockerwit pass and Woods harbour	20
Cooks cove, Toby cove	4
Calf island bay	5
Canning river	6
D'Escousse and Lennox passage	25
Digby and Annapolis	13
Dover	6
East bay, Bras d'Or	3
Fourchu harbour	11
Great Bras d'Or	7
Gillis point, Boulacoet	1
Guysborough	3
Hay cove	14
Harbour au Bouche..(6 stakes)	4
Ingonish, South bay	8
Isaacs harbour	12
Indian harbour	4
Jeddore	9
Judique	1
Ketch harbour	6
L'Ardoise	3
Lahave	8
Little Narrows	10
Little Dover	9
Little Bras d'Or	2
Liverpool	3
Lockeport	6
Lunenburg	9
" back cove	9
" middle south	16
Louisburg	7
Liscombe	4

NOVA SCOTIA—*Continued.*

	No. of Buoys.
Mabou	19
Mahone bay and Chester	12
Main-à-Dieu	6
Margaree harbour	9
Merigomish	6
Marie Joseph	11
Monsellier	10
McKinnon harbour	4
Musquodoboit	7
Martins Brooke	6
Northport	12
North Sydney	5
Parrsboro	6
Petitdegrat	11
Pictou	6
Popes harbour	3
Port Felix	10
Port Hood	7
Port Le Tour	15
Port Medway	9
Port Morien	2
Port L'Hebert	12
Pubnico	18
Pugwash	9
Prospect, Lower	10
Port Mouton	4
Queensport	3
River John (stakes)	3
Roseway	3
St. Anns	3
St Mary river	8
" up to Sherbrooke	18
St. Peter's bay	16
St. Peters inlet	10
Sambro	11
Shag harbour	13
Sheet harbour	9
Shelburne	10
Ship-harbour	9
Ship rock	1
Shulee	8
Smith's island	1
Sydney	2
Shag bay	2
Sober island to Ecum Secum	21
Tangier	4
Tatamagouche, 46 stakes and	18
Terrence bay	3
Tor bay	19
Three fathom harbour	5
Tidnish	5
Tusket (two contracts) (3 spindles)	30
Upper Prospect	4
Wallace	15
West bay	3
West Dublin and Crooked channel	13
Westport	3
Weymouth	13
Whitehead	9
Yarmouth	50
Maintained by agency—	
(whistling-buoys)	27
(bell-buoys)	30
(conical and can-buoys)	172
(gas-buoys)	4
(combined gas and bell buoys)	1
(combined gas and whistling)	12
(light vessels)	2

LIST OF BEACONS AND BUOYS—BRITISH COLUMBIA.

North bank buoy, platform, cage and drum, Clayoquot sound.
Vargas rock buoy, platform, cage and ball, Clayoquot sound.
Meares spit buoy, platform and cage, Clayoquot sound.
Browning passage buoy, spar, Clayoquot sound.
Browning passage buoy, spar, Clayoquot sound.
Browning passage buoy, spar, Clayoquot sound.
Hankin rock buoy, platform and cage, Clayoquot sound.
Templar rock buoy, steel can and drum, Clayoquot sound.
Whistling buoy, steel frame and whistle, Amphithrite point.
Sutton rock buoy, platform and cage, Barkley sound.
Swale rock beacon, framework and light, Barkley sound.
Somas river beacon, three piles, Barkley sound.
Somas river beacon, three piles, Barkley sound.
Somas river beacon, three piles, Barkley sound.
Whistling buoy, steel frame and whistle, Port San Juan.
Rosedale rock buoy, steel can, Race rocks.
Whale rock buoy, spar, Esquimalt.
Patterson rock buoy, platform and cage, Esquimalt.
Dyke point beacon, wooden cone, Esquimalt.
Canteen buoy, platform and cage, Esquimalt.
Channel rock buoy, platform, cage and drum, Victoria.
Middle beacon, three piles and light, Victoria.
Songhies point buoy, spar, Victoria.
Hospital rock buoy, platform and cage, Victoria.
Shoal point beacon, three piles and light, Victoria.
Brotchie ledge beacon, steel and concrete, light and fog signal, Strait of Juan de Fuca.
Lewis rock, masonry and drum, Baynes passage.
Johnstone reef buoy, steel can, Haro strait.
Zero rock beacon, masonry and cone, Haro strait.
Kelp reef beacon, masonry and ball, Haro strait.
Escape reef beacon, wooden cone and drum, Stuart channel.
False reef buoy, steel can, Stuart channel.
Coffin island beacon, framework and light, Stuart channel.
South beacon (Holland bank), three piles and drum, Oyster harbour.
North beacon (Dunsmuir islands), three piles and drum, Oyster harbour.

LIST OF BEACONS AND BUOYS—BRITISH COLUMBIA—*Continued.*

White rock buoy, steel can, Trincomali channel.
Danger reef beacon, framework and light, Trincomali channel.
False narrows buoy, spar, False narrows.
False narrows buoy, spar, False narrows.
Middle reef buoy (east), spar, False narrows,
Middle reef buoy (west), spar, False narrows.
Shark cove buoy (canal), spar, northern shore, south Pender island.
Shark cove buoy (canal), spar, southern shore, north Pender island.
Shark cove buoy (canal), spar, southern shore, north Pender island.
Rosenfeld reef buoy, steel can and cage, strait of Georgia.
Gossip reef buoy, steel can, Active pass.
Sandheads buoy, steel frame and bell, Roberts bank, strait of Georgia.
Fraser river entrance buoys, steel conical, black, seven in number.
Fraser river entrance buoys, steel conical, red, seven in number.
Fraser river buoy, spar, red, Woodward slough.
Fraser river buoy, spar, black, Woodward slough .
Fraser river north arm buoys, spar, position and number to suit navigation.
Fraser river north arm beacons, single piles, position and number to suit navigation.
Point Grey fairway buoy, steel framework, Burrard inlet.
Spanish bank beacon, five piles and drum
Burrard inlet.
West beacon, First narrows, five piles and square, Burrard inlet.
East beacon, First narrows, five piles and triangle, Burrard inlet.
First narrows buoy, spar, Burrard inlet.
Parthia shoal beacon (west), mast with drum, Burrard inlet.
Parthia shoal beacon (east), mast with drum, Burrard inlet.
Burnaby shoal buoy, spar, Burrard inlet.
Gibson's landing beacon, masonry and ball, shoal channel, Howe sound.
Rock point reef buoy, spar, strait of Georgia.
Welcome point reef buoy, spar, strait of Georgia.
Darcy rock buoy, steel can, Sidney channel.
Sidney spit buoy (east), steel can, Sidney channel.
Sidney spit buoy (west), steel conical, Sidney channel.
Sidney spit beacon, wooden cone and ball-Sidney spit.
Sidney wharf buoy (south), spar, shoal off wharf.
Sidney wharf buoy (north), spar, shoal off wharf.
Sidney rock buoy, platform and cage, rock off wharf.
Dock island beacon, framework and light, Dock island.
Canoe rock beacon, masonry and drum, Canoe rock.
Colbourne buoy (south), platform and drum, Colbourne passage.
Colbourne buoy (north), platform and ball, Colbourne passage.
Celia reef buoy, steel conical, Shute passage
Shute rock beacon, masonry and ball, Satellite channel.
Kelp rock buoy, steel conical, Satellite channel.
Batt rock buoy, steel can, Ganges harbour.
Horda rock buoy, platform and ball, Ganges harbour.
Enterprise beacon, masonry and ball, Trincomali channel.
Benmohr rock buoy, platform and ball, Trincomali channel.
Atkins beacon, masonry and ball, Trincomali channel.
Governor rock buoy, platform and ball, Trincomali channel.
Walker beacon, masonry, framework and light, Trincomali channel.
Victoria rock buoy, steel can, Trincomali channel.
Romulus rock beacons, two posts and slats, Galiano island, Porlier pass, south of rock.
Romulus rock beacons, two posts and slats, Galiano island, Portier pass, east of rock.
Portier pass, fairway buoy, steel can and drum, Portier pass.
Grappler rock buoy, steel can, Houston passage.
Crofton beacon, framework and light, Osborn bay.
Indian reef buoy, steel can, Stuart channel.
North reef beacon wooden cone and ball, Stuart channel.
Tattenham ledge buoy, spar, Malaspina strait.
Atrevida reef buoy, spar, Malaspina strait.
North point, Texada buoy, spar, Malaspina strait.
Gabriola reef beacon, masonry and ball, strait of Georgia.
Snake island buoy, steel conical, strait of Georgia.
Horsewell reef buoy, steel can, strait of Georgia.
Clarke rock buoy, platform and pyramid, strait of Georgia.
Dorcas rock buoy, spar, strait of Georgia.
Kelp reef buoy, steel frame and bell, strait of Georgia.
Cortes island buoy, steel can, strait of Georgia.
Whaleton rock buoy, spar, Whaleton bay.
Shark spit beacon, five piles and drum, Mary island spit.
Channel rock spindle, iron spindle and drum, Mary island spit.
Camp point beacon, pyramid and cone, Johnstone strait.
Ledge point buoy, spar, Broughton strait.
Walbran rock buoy, spar, Fisher channel.
White point beacon, pyramid, Lama passage.
Regatta rock beacon, pyramid and ball, Lama passage.
Dall patch buoy, platform, pyramid and ball, Lama passage.
White stone beacon, square and drum, Lama passage.
Whistling buoy, steel frame and whistle, Vancouver rock, Milbank sound.
Watson rock beacon, pyramid and drum, Grenville channel.
Hazel point buoy, spar, Middle passage.
Alford reef buoy, steel can, Metlakatla harbour.
Tugwell reef buoy, spar, Metlakatla harbour.
Shrub beacon, masonry and ball, Metlakatla harbour.

LIST OF BEACONS AND BUOYS—BRITISH COLUMBIA—*Continued.*

Harbour channel buoy (west), platform and drum, Metlakatla harbour.
Harbour channel buoy (east), platform and drum, Metlakatla harbour.
Hodgson reef buoy, steel can, Chatham strait.
Sparrowhawk rock buoy, steel can, Cunningham passage.
Hankin reef buoy, platform and pyramid, Cunningham passage.
Dodd passage buoy, spar, Port Simpson harbour.
Harbour reef buoy, steel conical, Port Simpson harbour.

SOOKE HARBOUR.

Whiffen spit beacon, framework and light, Sooke harbour entrance.
Sooke beacons, single piles, three in number.

MUD BAY.

Blackie spit beacon, three piles, west extreme spit.
Blackie spit beacon, single pile, south side channel.
Blackie spit beacon, single pile, south side channel.
Main channel beacons, single piles, 3, east side of channel.
Junction beacon, three piles, Slue and Serpentine.
Slue beacons, single beacons, 18, on banks of Slue, where required.
Serpentine beacons, single beacons, 15, on banks of Serpentine, where required.
Nicomeck'l beacons, single beacons, 6, on banks of river, where required.

NANAIMO HARBOUR.

Harbour light beacon, framework and light, south side of entrance.
Entrance buoy, platform, pyramid and triangle, south side of south channel.
Gallows point buoy, platform, pyramid and triangle, north side of entrance.
South channel buoy, platform, pyramid and triangle and diamond, south side, south channel.
Middle bank buoy, platform, pyramid and triangle and ball, south end, middle bank.
South channel buoy, platform, pyramid and triangle and diamond, south side, south channel, west end.
Satellite reef buoy, platform, pyramid and triangle and ball, south end of reef.
Mill stream buoy, platform, pyramid and triangle and triangle, east extreme of shoal.
Carpenter rock buoy, platform, pyramid and triangle and ball, close eastward of rock.
Middle bank buoy, spar, southwest shoulder of bank.
Middle bank buoy, spar, west shoulder of bank.
Middle bank beacon, five piles and light, north end of bank.
Beacon rock, masonry and ball, on summit of rock.

PROTECTION ISLAND PASSAGE.

Passage rock buoy, platform, pyramid and triangle, close east of rock.

DEPARTUURE BAY.

Departure bay buoy, platform, pyramid and ball, west extreme of shoal.

KOOTENAY LAKE.

Kootenay river mouth, buoy, platform, pyramid and cross, northwest end spit, entrance west channel, south arm.
Kootenay river mouth buoy, platform pyramid and cross, south end island, same entrance.
Balfour buoy, spar, outer end spit, west arm, north side.
Proctor buoy, platform, pyramid and cross, outer end spit, west arm, south side.
Proctor middle ground buoy, spar, on the shoal, between Proctor and Balfour.
Middle ground buoy, platform, pyramid and cross, east of Narrows.
Narrows buoy, platform, pyramid and cross, near Saw-mill point.
Middle ground buoy, platform, pyramid and cross, between old mill and narrows.
Thirteen mile point, buoy, platform, pyramid and cross, north end, spit.
Yuills shoal, upper end buoy, platform, pyramid and cross, off Kokani creek.
Yuills shoal, lower end buoy, platform, pyramid and cross, off Kokani creek.
Nine mile point buoy, platform, pyramid and cross, north end of spit.
Seven mile point buoy, platform, pyramid and cross, north end of spit.
Six mile point buoy, platform, pyramid and cross, north end of spit.
Five mile point buoy, platform, pyramid and cross, north end of spit.
Shipyard shoal buoy, platform, pyramid and cross, opposite shipyard, near Nelson.

SUBMARINE SIGNALS.

The department has established at Chebucto Head, approach to Halifax harbour, an electric submarine signal station. The submarine bells, two in number, with independent cables, are located 2 cables N. 1 degree E. from the inner automatic gas and whistling buoy in latitude N. 44 degrees 31′ 51″ and W. 63 degrees 30′ 0″, and during thick and heavy weather a signal consisting of four strokes at intervals of 4½ seconds followed by a silent interval of 6½ seconds.

In order to mark the position of the bell tripods, two, one red, wooden spar buoys have been attached thereto.

Work in connection with the establishment of similar submarine signal stations is under way at the following points, viz.: Louisburg, N.S., Yarmouth, N.S., and Negro Head, N.B. The buildings required for the stations will be erected by the chief engineer's branch.

Submarine bell buoys.—The department has in service special submarine bell buoys made by the Submarine Signal Company of Boston, and also submarine bell attachments on the automatic gas buoys, and any extension of this system required in future will be along this line. Where an automatic gas buoy is in position it is considered better to add a submarine bell attachment rather than to moor alongside a special submarine bell buoy. All automatic gas and whistling buoys have been provided, free of charge, to the department, with receptacles to carry the submarine bell attachment.

Delay has been experienced in obtaining from the Submarine Signal Company the required attachments, but by the opening of navigation, 1907, a number should be in operation.

The following submarine bells were in operation during the past season, viz.:—

1. Lurcher lightship.
2. Anticosti lightship.
3. Red Island lightship.
4. Prince Shoal lightship.
5. White Island lightship.
6. Egg Island bell buoy.
7. Sambro bell buoy.
8. Halifax Harbour (station at Chebucto Head).

The Shipping Federation of Canada has requested that the following additional bells be established, viz.:—

Bird Rocks.
St. Pauls.
Belle Isle.
Green Island.
South Point, Anticosti.
Pointe aux Basque.
Cape Race.
Platt Point, Little Miquilon.
Point Anguille, near St. George's Bay, Newfoundland.
Fame Point, Gaspé peninsula.
Cap Rosier, Gaspé peninsula.
Matane, Gaspé peninsula.
Point Snel, Gaspé peninsula.
Flat Point, near Sydney harbour.
Scatari, C.B.
Whitehead, N.S.

Beaver Island, N.S.
Little Hope, near Liverpool bay.
Brazil Rocks, S.W. Nova Scotia and Bay of Fundy.
Blonde Rocks.
Gannet Rock.
Beatson's Rock.
Partridge Island, St. John, N.B.

The Submarine Signal Company has advised the department that up to December 1, 1906, the following vessels have been equipped with submarine signal apparatus:—

North German Lloyd Line—
- Kaiser Wilhelm II.
- Kaiser Wilhelm der Grosse.
- Kronprinz Wilhelm.
- Barbarossa.
- Friedrich der Grosse.
- Grosser Kurfurst.
- Prinzese Alice.
- Main.
- Rhein.
- Neckar.
- Bremen.
- Seeadler.

White Star Line—
- Baltic.
- Oceanic.
- Republic.
- Arabic.
- Cymric.
- Cedric.
- Canopic.
- Majestic.
- Cretic.
- Teutonic.
- Romanic.
- Celtic.

Cunard Line—
- Lucania.
- Ivernia.
- Saxonia.
- Campania.
- Caronia.
- Carmania.

Hamburg-American Line—
- Deutschland.
- Amerika.
- Kaiserin Auguste Victoria.
- Cap Vilano (South America).

French Line—
- La Savoie.
- La Lorraine.
- La Province.

Canadian Pacific Line—
- Mount Temple.
- Montcalm.
- Lake Manitoba.

Dominion Line—
- Canada.

Metropolitan Line—
- J. S. Whitney.
- H. M. Whitney.
- Herman Winter.
- H. P. Dimock.

Boston & Philadelphia Line—
- Indian.
- Persian.
- Grecian.
- Tuscan.

Merchant & Miners Trans. Line—
- Nantucket.
- Gloucester.
- Juniata.
- Kershaw.
- Ontario.

Old Dominion Line—
- Munroe.
- Princess Ann.
- Jefferson.
- Hamilton.
- Jamestown.

Dominion Coal Co.—
- Cacouna.
- Cape Breton.
- Bonavista.
- Louisburg.

Red Cross Line—
- Rosalind.
- Silvia.

Plant Line—
- Halifax.

Eastern Steamship Co.—
- Calvin Austin.

Holliday Brothers—
- Aranmore.
- King Edward.

Thomson Line—
- Cervona.

Campbell & Co.—
- Strathcona.

Wm. Murdock—
- Dufferin.

Standard Oil Co.—
- Standard.

Suskehanna Coal Co.—
- Paoli .
- Tacony.

Commercial Cable Co.—
- Mackay-Bennet.

Commercial Tow Boat Co.—
- Dudley Pray.

Kink Tow Boat Co.—
- Gypsum King.

Woermann Line (Germany to South Africa)—
- Gertrud Woermann.
- Adolph Woermann.

Luckenbach Trans. & Wrecking Co.—
- Edgar F. Luckenbach.

Boston & Baltimore Barge Co.—
- Boswell.

T. J. Scully—
- John Scully.

J. S. Emery & Co.—
- Governor Ames.

Coastwise Transportation Co.—
Samuel J. Goucher.

E. G. Potter, et al—
Jennie French Potter.

Staples Coal Co.—
Cuba.

Percy & Small—
Eleanor A. Percy.

Maine Steamship Co.—
Horatio Hall.

Dublin Steam Packet Co.—
Wicklow.

Pilot Boats, Boston—
America.
Louise.
Liberty.
Varuna.

New York—
New York.
New Jersey.
Washington.
Ambrose Snow.
Hermit.

Philadelphia—
Philadelphia.

Liverpool—
Francis Henderson.
Bernard Spear.
Queen Victoria.
David Fernie.

Steam Yachts—
Corsair.
Wacondah.
Sabrina.

Steam Yachts—Con.
Constant.
Constellation.

Fishing Schooners—
Mary E. Harty.
Arkona.

Submarine Boats, U.S.—
Octopus.
Cuttlefish.
Starling (tender).

United States Government—
Maine (Battleship).
Alabama (Battleship).
Connecticut (Battleship).
Mayflower (L. H. Tender).
Iris (L. H. Tender).
Larkspur (L. H. Tender).
Gresham (Revenue Cutter).
Armenia (L. H. Tender).
Bache (Coast Survey).

Canadian Government—
Canada (L. H. Tender).
Lady Laurier (L. H Tender).
Lansdowne (L. H. Tender).
Minto (ice-breaker).
Stanley (ice-breaker).

French Government—
Emile Allard (Tender).

English Government—
Galatea (Tender).
Irene (Tender).
Vigilant (Tender).
Antrim (Cruiser).
Spanker (Gun Boat).

German Government—
Wik.

Number of Light Stations, Lights, Fog Alarms and Warning Buoys in the Dominion.

—	Light Stations.	Lights.	Keepers.	Fog whistles sirens and diaphones.	Fog horns.	Fog bells.	Fog guns or bombs.	Gas buoys.	Whistling buoys.	Bell buoys.
Province of Ontario and above Montreal	226	303	209	13	6	4	.....	50	.....	3
Lightships	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Province of Quebec	169	247	215	12	8	1	7	78	1	1
Lightships	7	.....	.....	.....	.....	.....	.....	.....	.....	.....
Province of Nova Scotia	228	232	233	12	10	3	1	9	45	30
Lightships	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Province of New Brunswick	109	142	111	8	7	2	1	12	12	13
Lightships	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Province of Prince Edward Island	41	70	66	.....	1	.....	.....	1	3	2
Province of British Columbia	47	55	45	6	9	6	.....	1	5	4
Lightships	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Province of Manitoba	5	4	4	.....	.....	.....	.....	.....	.....	.....
	838	1,053	883	53	41	16	9	151	53	69

APPENDIX No. 3.

SOREL SHIPYARD.

SOREL, October 22, 1906.

Lt. Col. F. GOURDEAU,
Deputy Minister of Marine and Fisheries,
Ottawa.

Sir,—I have the honour to report on the work done at the Sorel shipyard during fiscal year ending June 30, 1906.

DREDGE 'W. S. FIELDING.'

This is a steel twin screw hopper dredge constructed for the Department of Public Works. The hull of the dredge is 254 feet long by 52 feet beam, by 18 feet depth. She is equipped with a chain of elevator buckets and a suction pipe and is designed to dredge in 50 feet of water. This dredge was about finished in the year 1904-5. In the present year she was completely finished and tested in July and August. In the beginning of September she left Sorel to work on the sea coast. A number of spare parts were made for this dredge.

TUG 'PORTNEUF.'

This is a wooden vessel 85 feet long over all, 17 feet 3 inches beam, with a depth of 9 feet 9 inches. This vessel was begun in February, 1905, and was finished in August of the same year. She is for use with the dredging fleet of the St. Lawrence ship channel.

The main engine was compounded from the single cylinder engine of the dismantled tug *St. Francis*. A new marine boiler 8 feet 6 inches diameter by 8 feet 6 inches long, was built at the Sorel shipyard for this vessel. The vessel has accommodation for both day and night crew.

DUMP SCOWS.

Three of the dump scows, Nos. 1, 2 and 3, belonging to the St. Lawrence ship channel dredging fleet were partly rebuilt during the year.

TUG 'JESSIE HUME.'

This tug which belongs to the dredging fleet of the St. Lawrence ship channel, was partly rebuilt during the winter. Her hull was rebuilt from the water line up and her cabin work was entirely rebuilt and increased, giving accommodation for both day and night crews.

STEAMER 'LA CANADIENNE.'

This steamer which was transferred from the fishery service to the hydrographic survey, was partly rebuilt for the use of the latter service. The upper deck was extended forward; a new chart room, wheel house and cabins were built on this upper deck, new cabins were built on the main deck.

The officers' quarters aft were remodelled and refitted; an electric light plant was installed and the vessel was altered so as to fit her out as a survey boat.

SEA GOING HOPPER SUCTION DREDGE.

This is a steel dredge for use in the St. Lawrence ship channel. The hull is 264 feet long by 45 feet beam by 20 feet deep. This dredge is to be fitted with a centrifugal dredging pump working in a central well to a depth of 65 feet below load water line. The dredge will be equipped with twin screws driven by triple expansion engines. The pump will also be driven by an engine of the same type. There will be two cylindrical marine boilers 13 feet 6 inches diameter by 11 feet long.

Plans of this dredge were prepared in the Sorel shipyard in the spring and summer of 1905. The contract for the steel plates and shapes for the building of this dredge was given in October, 1905, and construction was begun in January, 1906. The framing was nearly all erected by the end of June, 1906.

STEAMER 'ROUVILLE.'

This is a wooden steamer for the use of the Mounted Police Department in Hudson Bay. The hull is 130 feet over all by 26 feet beam by 16 feet deep, with a draft of water of 12 feet 6 inches. The hull of the vessel is built of oak, rock elm and southern pine, and is extremely heavy so as to resist the ice pressure which may be encountered in Hudson bay. The boat is equipped with a compound engine with cylinders 18 by 36 inches diameter, by 24-inch stroke, driving a propellor wheel 8 feet 6 inches in diameter, provided with removable blades.

The boiler is of Scotch marine type, 12 feet 6 inches in diameter by 10 feet long, with a working presure of 140 pounds.

This vessel was begun in November 1905. She was launched on June 9 and was nearly finished by the end of the fiscal year. She was ready for service in the beginning of August, 1906.

STEAMER 'VERCHERES.'

This is a small wooden steamer for the use of the lighthouse inspection staff. The hull is 100 feet in length by 16 feet beam by 9 feet depth of hull, with a draft of 7 feet 6 inches and a displacement of 126 tons. Work on this boat was begun in January. The construction of the hull was well advanced by the end of the fiscal year.

STEEL TOWERS.

Steel towers for lighthouses were built for Bécancour, Ste. Anne, Champlain, Ile du Moine and Ile de Grâces, between Montreal and Quebec, and one steel tower was built for use at Souris, P.E.I. Repairs and alterations were also made to some other steel lighthouse towers. Different vessels attached to the inspection and construction of lighthouses were repaired during the year and coal and supplies were furnished to these vessels.

REPAIR WORK FOR ST. LAWRENCE SHIP CHANNEL.

A large part of the work done at the Sorel shipyard consists of the maintenance of the vessels of the St. Lawrencee ship channel dredging fleet. The hulls and machinery of these vessels were maintained in good condition during the fiscal year 1904-5. During the winter the machinery was completely overhauled and repaired. The hulls and cabin work were painted and the equipment was repaired and put in proper condition.

Clutches and frictions were added to the bow winches on four dredges to enable them to run up their wires faster. On four of the hoisting winches larger cylinders were installed and bronze worm wheels with cut steel worm gearing were attached so as to give greater power.

The steamer *Frontenac* had new cylinders on her main engines.

Dredge No. 1 had a new furnace in one of her boilers and this boiler was thoroughly overhauled and given heavy repairs.

Dredge No. 4 was docked in Tait's dry dock, Montreal, for repairs to the hull: these repairs being effected by the shipyard staff.

Dredge No. 7 had very heavy repairs to her boilers. Her pontoons were hauled up during winter, scraped and painted.

REPAIR WORK FOR DEPARTMENT OF PUBLIC WORKS.

Several of the vessels belonging to the dredging fleet of the Public Works Department were repaired at the shipyard during the year 1904-5.

The dredge *St Louis* and her dump scows and the tugs *Ottawa* and *Daisy* were hauled out and repaired during the year.

A new bucket was fitted for the dredge *International* . A new arm was built for the dredge *Progress* and various minor repairs were made.

Coal and other materials were also furnished to these vessels during the year.

HAULING OUT.

The slip ways of the shipyard were kept busy during the year hauling out various vessels of the dredging fleet and of other departments for repairs. Thirty-six vessels were hauled out during the season. The following vessels were hauled out for the winter and launched again in the spring : Dredge *St. Louis* and two scows, steamer *Alpha,* steamer *Maisoneuve,* tug *Daisy,* dump scows Nos. 1, 2 and 3.

HYDROGRAPHIC SURVEY.

The steamer *De Levis,* attached to the Hydrographic Survey of the river St. Lawrence, was kept in repair during the year.

The steamer *La Canadienne* was given supplies and materials.

STEAMER 'ARCTIC.'

The steamer *Arctic* wintered at Sorel after her cruise in Hudson bay. The machinery of the vessel was overhauled and repaired, and some alterations were made in the engines and boilers. The hull of the vessel was scraped, caulked and painted. New sails were provided. A storage battery and air compressor were installed and the vessel was generally repaired and put in good condition. Materials and supplies were also furnished for next cruise.

IMPROVEMENTS TO SHIPYARD.

A building with steel frame and brick walls, 52 feet by 32 feet, was built for use as a substation. The high voltage current received from the Sorel Electric Company is here converted into low potential, alternating and direct current, suitable for light and lighting purposes in the shipyard. A 300 horse-power motor generator was installed in this substation. A Rand compound air compressor was also installed. This machine has a capacity of 700 cubic feet of air per minute and is driven by a direct current electric motor of 125 horse-power. This substation was ready for operation at the end of December. Since this time the steam engines of the shipyard have been idle and all machinery has been run by electric power. For this purpose a number of dynamos were installed and a system of electric wires was run through the shipyard.

WHARF NO. 4.

This is a new wharf which was begun in the previous year. The wharf is 150 feet in length and replaces an old railway wharf which had become dangerous and had to be demolished.

SAW MILL.

A building 60 feet by 70 feet, two stories high, with two one-story wings, each 28 by 55 feet, was erected for use as a saw mill and for the accommodation of the woodworking machinery of the shipyard. This building is steel frame, with wooden walls and floors of slow burning construction. The foundations are of rough masonry. The electric motors and heavy line shafting driving the machinery are in the basement. This building was about completed by the end of the fiscal year and the machinery was being installed.

WATERWORKS.

Two electric driven turbine pumps were bought to replace the steam pump which supplied water to the shipyard. Some additional mains were laid.

GENERAL

All the buildings of the shipyard were painted during the year and all machinery was maintained in a good state of efficiency. An hydraulic machine for cutting steel channels and beams and doing light flanging was installed in the boiler shop. An extension was built to the blacksmith ship and three new forges erected. The railway of the shipyard was extended to allow of better distribution of material. The working force at the shipyard during the year varied from 400 to 750 men, and averaged 560. The financial statement, which I append, shows that the total amount expended at the Sorel shipyard during the year 1905-6 is $888,960.04.

Yours truly,

G. J. DESBARATS,
Director of Shipyard.

STATEMENT of amounts received by the Sorel Ship Yard from different Appropriations and expended during the Fiscal Year 1905-6.

Year.	——		Amount.
1906.			$ cts.
June 30.—	To Appropriation for ship channel actually expended		587,956, 84
" 30...	Appropriation for construction of sea-going hopper dredge		150,001 32
" 30...	Appropriation for construction of Hudson's Bay patrol boat, str. *Rouville*		55,000 00
" 30...	Construction of lights, Que		11,700 91
" 30...	Maintenance of lights, Que		1,438 42
" 30...	Hudson's Bay expedition str. *Arctic*		279 86
" 30...	Steamer *Maisonneuve*		1,720 22
" 30...	Construction str. *Vercheres*		11,209 22
" 30...	Public Works Department		16,840 42
" 30...	Hydrographic Survey—		
	Str. "*De Lévis*	$ 4,429 21	
	Str. *La Canadienne*	16,116 89	
			20,546 10
" 30...	Dredge *Galveston*		13,847 81
" 30...	Sundry refunds	$ 31 61	
" 30...	Sundry refunds, fiscal year 1904–5	18,387 31	
			18,418 92
	Total		888,960 04

APPENDIX No. 4.

METEROLOGICAL REPORT.

METEOROLOGICAL OFFICE,
TORONTO, September, 1906.

Lieut.-Col. F. GOURDEAU,
Deputy Minister of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to submit the thirty-fifth annual report of the Meteorological Service of Canada, this report being for the fiscal year, July 1, 1905, to June 30, 1906, with Appendices A and B, reports of St. John and Quebec observatories.

The number of persons in receipt of pay from the Meteorological Service on June 30 for various duties performed in connection therewith was 210. Of this number 22 were employed in the central office and with a few at outside stations, devote their whole time to work of the service ; others are occupied in observing during only a portion of each day, and others again are employed only to attend to the display of storm signals were notified.

There are now in the Dominion, Newfoundland and Bermuda 395 stations, using instruments which have been supplied by the government. At 38 stations, distributed at nearly equal intervals throughout Canada, three or more observations are taken daily and each morning and evening reports are telegraphed to Toronto. At 49 other points, observers receive remuneration for a more or less extended series of observations. Special observations for the Western Bulletin Service are taken at 23 places where small gratuities are paid ; 71 persons are paid for attending to the display of storm signals alone, and for the time service and special telegraph service 6 persons are employed.

Since the issue of my last report the following stations have been opened :—

BRITISH COLUMBIA.

Class II.—Athalmer, R. S. Gallop.
" II.—Fairview, J. R. Brown.
" II.—Salmon Arm, R. Hobson.
" III.—Hartley Bay, F. C. Winterbourne.

YUKON TERRITORY.

Class III.—Dawson, J. B. Tyrrell.
" III.—Victoria Gulch, P. Holloway.

ALBERTA.

Class III.—Conjuring Creek, J. A. Sangster.
" III.—Grassy Lake, D. K. Slawson.
" III.—Heather Brae, A. W. Fleming.
" III.—Josephsburg, James Robinson.
" III.—Nanton, A. D. Meacham.
" III.—Okotoks, Jos. D. Pugh.
" III.—Rocky Coulee, Albert Luchie.
" III.—Stavely, A. Brand.
" III.—Sion, F. W. Nash.
Saddle Lake, J. W. Carroll.
Class III.—St. Paul des Metis, Elzear Poitras.
Wabamun, J. C. Haddock.

SASKATCHEWAN.

Class II.—Fond du lac, Anton Biehler.
" II.—Lemberg, G. A. Bock.
" II.—Willow Bunch, M. A. Noel.

MANITOBA.

Class II.—Carberry, Henry Griffith.

ONTARIO.

Class III.—Kioskoque Lake, Thos. H. Ledwood.
" III.—Strathroy, B. Gott.

Midway, B.C., Deseronto, Ont., and Ste. Agathe des Monts, Que., have from various causes ceased to report.

Sunshine recording instruments have been supplied to Haileybury, Kamloops, Medicine Hat, Calgary, Edmonton, Sherbrooke, Charlottetown, Dunvegan, and from some of these very good reports have been obtained.

CENTRAL OFFICE.

Increased accommodation in the central office is required as the staff is much cramped and it is difficult to find shelving room for climatic and meteorological records, and desk room for the staff.

The observatory has, through the expansion of the university, been deprived of all the land originally appertaining to it and there is now no suitable exposure for meteorological instruments in the vicinity. A portion of the building has been demolished to make way for the foundation of the new physical laboratory and part of the staff have been obliged to occupy rooms in a cottage acquired for use temporarily, or as the chairman of the university board of trustees has stated in writing, for one year from the spring of 1906. It would scarcely be possible that the situation could be in a more unsatisfactory condition for the carrying on of the meteorological work, and such is the case at a time when with the western provinces rapidly filling up and trade flourishing, seekers after climatological statistics and inquirers regarding weather conditions are rapidly on the increase. From the maritime provinces there has been an unprecedented demand for storm signals, and in the prairie provinces agriculturists are demanding a more extensive and more widely disseminated weather bulletin.

In September, 1903, with the authority of the department I fenced in the lot of land at the corner of Bloor and Devonshire place and placed therein a set of thermometers, a rain gauge and evaporating tank, thus to a great extent preserving the continuity of the records of these instruments.

In April last, acting under departmental instructions, I looked about Toronto, endeavouring to find some suitable quarters which might be temporarily occupied by the meteorological staff, until such time as a new building could be erected. It was found, however, that no suitable building was available and that it would be far better to remain in the old building. This being chiefly owing to the fact that in the old building is installed the transit instrument used for obtaining the time for Toronto and a portion of Ontario and for checking the time service of Quebec and the maritime provinces; also the seismograph for registering earthquakes occurring in far off countries; and the results obtained here are a most important contribution to science, as seismological investigation is expected to show much as to the physical constitution of the globe; also a barometer and thermometers recording photographically.

No temporary installation for these instruments could be as satisfactory as the present buildings with all its disadvantages.

It is altogether advisable that a new meteorological office be erected with as little delay as possible in order that the work of the service may be carried on under favourable conditions.

During the past year there has been no change in the personnel of the central office staff which numbers twenty-two ; twenty of whom are permanent employees and two temporary clerks. In addition, however, it has occasionally been found necessary to obtain further temporary assistance to make abstracts of records required by the bureaus of other countries and by scientific investigators both at home and abroad.

I would again respectfully urge that larger salaries be paid to officers and clerks in the meteorological service. The pay now allowed is in my opinion in most instances not at all commensurate with the importance of the work performed, and is on a decidedly lower scale than that given in the United States weather bureau and also lower than in other branches of the Canadian civil service. There have been no salary increases in the central office since July 1, 1904, notwithstanding the fact that the work of the office has augmented and that the cost of living has been steadily increasing.

During the year, the Climatical Report of Canada, a volume of 384 pages, has been printed, and 890 copies distributed in the various countries of both the old and the new worlds and to meteorological observers throughout Canada. The report contains the more or less complete climatic records of 319 stations and the compilation has entailed an immense amount of work, as most of the observers simply fill in the figures daily, without adding up the monthly columns, and most of the computations are done in the Toronto office. In addition to this annual volume, a report on the rain and snowfall of Canada up to the end of 1902 has been published. This volume will be of great value, not only to meteorologists but also to engineers requiring information as to water supply for industrial installations. All rainfall and snowfall records obtainable from the earliest days have been included in the work.

The Monthly Weather Review and the Monthly Weather Map, each of them publications entailing much work, have been issued with regularity, and the Special Meteorological Register of the Toronto observatory for the year 1905 has also been printed and distributed.

The number of publications received in the library during the fiscal year was 330, being for the most part annual, quarterly and monthly reports, from the meteorological, astronomical and magnetical observatories of the world.

The daily weather map has been duplicated by means of the mimeograph and distributed to schools and public buildings, as well as to foreign weather services ; a copy is also furnished to the chief of the Tidal Survey to be used in connection with his work. I had hoped to be able to have this map lithographed, as I am sure that it is now far from being a credit to the service, not being as neat and plain as that issued by many other weather bureaus. This improvement cannot, however, be carried out with the present appropriation.

Weather forecasts covering 36 hours in advance and sometimes a longer interval have been issued twice daily throughout the year. The weather charts on which the forecasts are based have entered on them information obtained by telegraph from 35 stations in Canada and 64 stations in the United States, also reports from St. Johns, Newfoundland, and Bermuda. The forenoon chart is ready for inspection ordinarily about 9.45 a.m. and the forecast official having drawn the isobars, first issues a bulletin for the Maritime provinces, including forecasts for the current and following day for Nova Scotia, New Brunswick and Prince Edward Island, and for vessels leaving for the Grand Banks and for American ports. Then follows a forecast for the western provinces, which is telegraphed without delay to Winnipeg, where a local agent, who has meanwhile received weather telegrams from some 23 points additional to those received in Toronto, prepares a bulletin giving a general synopsis of existing weather conditions and also includes all weather reports received, together with the forecasts from Toronto. This bulletin is then distributed in Winnipeg and telegraphed to the more important centres in the prairie provinces. The Central Office forecast official lastly prepares a bulletin

for Ontario and Quebec, which is usually despatched about 10.10 and is published very widely by the afternoon press as well as being posted at telegraph offices, post offices and other frequented places. At all the larger towns in these provinces a special effort has been made to have these bulletins exposed on wharfs and docks within easy reach of shipping people and fishermen.

The evening weather chart, like that of the morning, is usually ready for inspection about 9.45; and with as little delay as possible a bulletin is prepared for the press and forecasts are issued for all parts of the Dominion exclusive of British Columbia. These forecasts are distributed by the telegraph companies to most of the telegraph offices in the Dominion, and by arrangement are posted up in a frame hung in a conspicuous place; nearly every morning journal publishes them generally on the front page.

During the winter months a very large number of special forecasts were made for shippers of perishable goods, inquiries being made by both telephone and telegraph. Indeed it is doubtful whether nearly all shippers of such goods in the Dominion do not now consult the weather service before sending forward consignments.

During the winter, special warnings of snow and drift were issued to all Canadian railways whenever it was deemed necessary, and various electric railways have made a practice of consulting the central office as to the weather of the coming night, the information supplied enabling them either to reduce the working staff on duty to a minimum, or on the other hand to take the usual measure to prevent snow blockade.

During the late autumn many telegrams were received from vessel masters wishing to cross the lakes requesting special forecasts as to probable winds and weather, and indeed in some cases asking as to the advisability of starting.

The following table shows the percentage of verification of the ordinary 10 p.m. forecast, issued from Toronto, and also that of the forecasts for British Columbia issued from Victoria, B.C.:

Month.	Victoria and Vicinity.					Lower Mainland.					Total for British Columbia.				
	Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.			
		Number fully.	Number partly.	Number not	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.
1905.															
July	107	88	4	15	84.1	90	75	1	14	83.9	197	163	5	29	84.0
August	119	99	7	13	86.1	108	92	2	14	86.1	227	191	9	27	86.1
September	108	77	16	15	78.7	103	69	14	20	73.7	211	146	30	35	76.3
October	104	74	16	14	78.8	91	60	11	20	72.8	195	134	27	34	75.6
November	113	80	13	20	76.5	111	74	22	15	76.6	224	154	35	35	76.6
December	103	66	11	26	69.4	93	66	9	18	75.8	196	132	20	44	72.6
1906.															
January	104	77	10	17	78.9	98	74	10	14	80.6	202	151	20	31	79.7
February	99	77	10	12	82.8	90	77	7	6	89.4	189	154	17	18	86.0
March	121	89	9	23	77.3	117	85	18	14	80.3	238	174	27	37	78.8
April	93	80	8	5	90.3	91	74	8	9	85.7	184	154	16	16	88.0
May	128	101	8	19	82.0	119	90	12	17	80.7	247	191	20	36	81.4
June	105	79	9	17	79.5	101	77	12	12	82.2	206	156	21	29	80.8
Total	1304	987	121	196	80.3	1212	913	126	173	80.5	2516	1900	247	369	80.4

NUMBER of Forecasts and percentage of fulfilment in each District in each Month, and in the Year ending June 30, 1906, issued from Central Office at Toronto.

Month.	Saskatchewan.					Alberta.					Manitoba.					Lake Superior.					Georgian Bay.				
	Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.			
		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.
1905.																									
July											89	63	18	8	77.5	110	64	35	11	75.0	125	102	21	2	90.0
August											85	70	12	3	89.4	131	96	32	3	85.5	133	113	17	3	91.4
September	90	61	21	8	79.4	85	62	19	4	84.1	91	67	17	7	83.0	117	89	20	8	84.6	123	105	13	5	90.6
October	86	64	13	9	82.0	83	56	13	14	74.1	87	71	9	7	86.8	116	85	22	9	82.7	122	100	16	6	88.5
November	84	61	18	5	83.3	81	64	12	5	86.4	92	68	17	7	83.2	119	97	14	8	87.4	124	93	24	7	84.7
December	87	64	18	5	83.9	85	62	14	9	81.2	87	65	16	6	83.9	106	82	15	9	84.4	120	95	16	9	85.8
1906.																									
January	83	72	9	2	92.2	84	72	8	4	90.5	83	68	13	2	89.8	101	74	20	7	83.2	114	93	17	4	89.0
February	72	54	11	7	82.6	72	62	8	2	91.7	72	57	7	8	84.0	88	70	15	3	88.1	101	83	12	6	88.1
March	85	79	4	2	95.3	85	76	6	3	92.9	93	81	7	5	90.9	95	82	10	3	91.6	117	85	25	7	83.3
April	84	60	17	7	81.5	83	68	10	5	87.9	86	61	19	6	81.9	100	73	20	7	83.0	108	95	11	2	93.0
May	84	64	16	4	85.7	84	57	21	6	80.3	86	60	13	13	77.3	114	68	32	14	73.7	120	89	21	10	82.9
June	83	61	18	4	84.3	85	72	10	3	90.6	91	76	13	2	90.7	109	89	16	4	89.0	122	107	15	....	93.8
Total	838	640	145	53	85.0	827	651	121	55	86.0	1042	807	161	74	85.2	1306	969	251	86	83.8	1429	1160	208	61	88.4

Month.	Lower Lakes.					Ottawa Valley.					Upper St. Lawrence.					Lower St. Lawrence.				
	Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.			
		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.
1905.																				
July	124	100	22	2	89.5	108	88	16	4	88.9	108	90	15	3	90.3	108	85	18	5	87.0
August	133	116	17	.....	93.6	131	103	21	7	86.6	131	105	18	8	87.0	134	94	28	12	80.6
September	125	107	17	1	92.4	106	98	7	1	95.7	105	97	7	1	95.7	114	92	17	5	88.2
October	122	106	9	7	90.6	104	89	12	3	91.3	104	89	12	3	91.3	119	87	20	12	81.5
November	124	95	25	4	86.7	115	85	25	5	84.8	115	86	27	2	86.5	119	96	15	8	87.0
December	120	92	19	9	84.6	110	93	15	2	91.4	109	94	13	2	92.2	104	79	11	14	81.3
1906.																				
January	114	98	12	4	91.2	103	86	14	3	90.3	103	89	11	3	91.7	108	89	16	3	89.8
February	101	87	11	3	91.6	89	75	11	3	90.4	90	75	13	2	90.5	98	85	10	3	91.8
March	117	95	18	4	88.9	110	90	13	7	87.7	110	90	13	7	87.7	106	88	14	4	89.6
April	108	92	14	2	91.7	98	80	16	2	89.8	98	80	16	2	89.8	103	71	20	12	78.6
May	120	92	20	8	85.0	99	82	14	3	89.9	99	81	15	3	89.4	113	85	16	12	82.3
June	122	109	12	1	94.3	109	85	18	6	86.2	109	89	16	4	89.0	116	83	25	8	82.3
Total	1430	1189	196	45	90.0	1282	1054	182	46	89.3	1281	1065	176	40	90.0	1342	1034	210	98	84.9

Month.	Gulf.					Maritime West.					Maritime East.					Total.				
	Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.				Number of Predictions.	Verified.			
		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.		Number fully.	Number partly.	Number not.	Percentage.
1905.																				
July	107	80	21	6	84.6	109	87	22	.....	89.9	109	93	13	3	91.3	1097	852	201	44	86.8
August	132	99	21	12	83.0	133	109	18	6	88.7	134	102	24	8	85.1	1277	1007	208	62	87.1
September	125	99	22	4	88.0	116	99	14	3	91.4	116	97	15	4	90.1	1313	1073	189	51	88.9
October	121	83	18	20	76.0	118	96	16	6	88.1	118	94	17	7	86.9	1300	1020	177	103	85.3
November	116	86	23	7	84.0	114	92	16	6	87.7	114	89	14	11	84.2	1317	1012	230	75	85.6
December	106	84	11	11	84.4	116	91	14	11	84.5	115	99	8	8	89.6	1265	1000	170	95	85.8
1906.																				
January	113	89	17	7	86.3	131	106	15	10	86.6	132	109	14	9	87.9	1269	1045	166	58	88.9
February	97	82	10	5	89.7	103	81	15	7	85.9	103	80	15	8	84.9	1086	891	138	57	88.4
March	108	93	10	5	90.7	125	109	10	6	91.2	123	109	7	7	91.5	1274	1077	137	60	88.9
April	101	70	20	11	79.2	104	73	19	12	79.3	102	70	22	10	79.4	1175	893	204	78	84.7
May	113	80	22	11	80.5	111	81	22	8	82.9	110	82	20	8	83.6	1253	921	232	100	82.8
June	122	85	28	9	81.1	125	90	25	10	82.0	125	88	23	14	79.6	1318	1034	219	65	86.8
Total	1361	1030	223	108	83.9	1405	1114	206	85	86.6	1401	1112	192	97	86.2	14944	11825	2271	848	86.73

STORM WARNINGS.

During the year, 1613 storm warnings were issued to the various districts in Canada where signals were displayed, and of this number 1,532 or 95·0 per cent were verified. On 463 occasions, however, the wind did not reach and on 106 occasions exceeded the force indicated by the signals displayed, also 98 warnings were received late owing to issue and 42 on account of delay in transmission.

In connection with the warnings the probable directions from which the gales would blow were also given, and of the 1,532 verified as to force, 1,190 or 77·7 per cent were fully and 1,431 or 93·4 per cent fully and partly verified. This is the best storm warning record in the history of the service.

At the close of navigation on the great lakes last autumn, I took occasion for the information of mariners, to call attention to the accuracy of the warnings issued by the Meteorological Service. The following is the letter referred to :—

METEOROLOGICAL OFFICE,

TORONTO, December 2, 1905.

The appalling loss of life and property on the Great Lakes during the months of October and November, together with the numerous articles which have appeared in the press relative to the stormy character of the past autumn, have rendered it important that a statement be offered to the public as to what warnings the Dominion Meteorological Service has given of these heavy and disastrous storms. The storms occurred on October 20, November 1, November 15, November 24, and November 28. In each instance the gale was forecasted in the weather bulletin issued from the central office, Toronto, on the forenoon of the previous day, and in every instance the gale signals were displayed well in advance of the storm. This is an important statement, and becomes doubly so when supplemented by the statement, that while every important storm of this past autumn has been predicted, there has been only one occasion on which the official bulletin forecasted a gale which did not occur, and on that day the forecast was, simply, that the wind would probably increase to a moderate gale on the following day on Lakes Erie and Ontario, and it failed to do so.

It is impossible to say how many lives and how many vessels have been saved by the storm warnings—as when a vessel remains in port on account of the warning, the captain very naturally is seldom prepared to allow that he would have been wrecked had he ventured out.

To mention simply the meteorological forecasts of the first and of the last of the heavy storms, namely those of October 20 and November 28: The 10 a.m. forecast of October 19 was : Easterly winds, increasing to gales ; rain to-night. Friday : North and north-west gales, showery and colder. Storm signals were displayed at all ports before 11 o'clock. Then, as regards that of November 28, the 10 a.m. forecast of the 27th read as follows : Fair and colder to-day and to-night ; Tuesday: Strong winds and gales north-east and east ; snow or rain. Storm signals were hoisted on Lake Superior ports at 10 a.m., and during the evening on the other lakes.

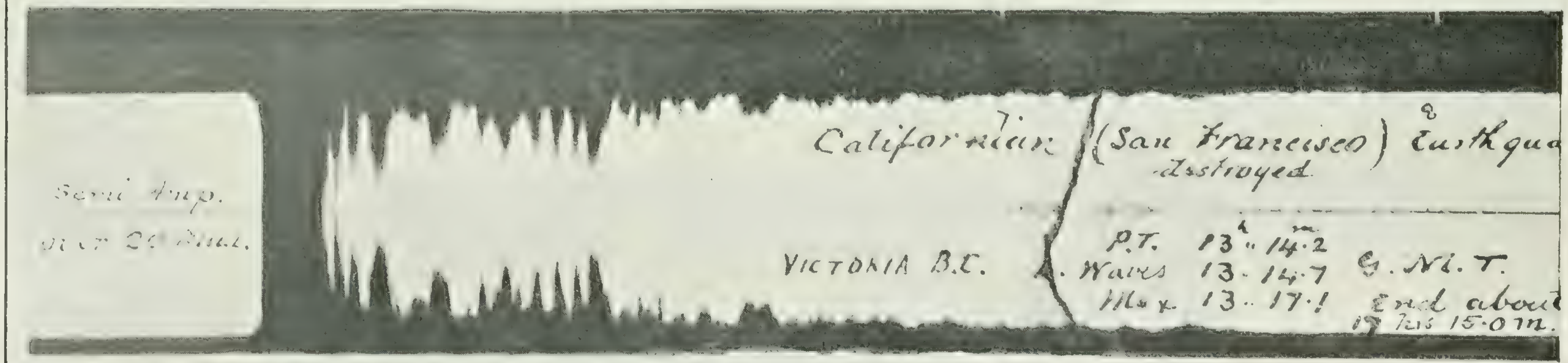
Many vessel masters do pay every attention to the weather forecasts and wire for special information before leaving port, but we maintain that, in view of the fact that the meteorological bulletins may be seen at almost every port in Ontario, no vessel whatever should leave harbour during the late autumn without having the latest forecasts.

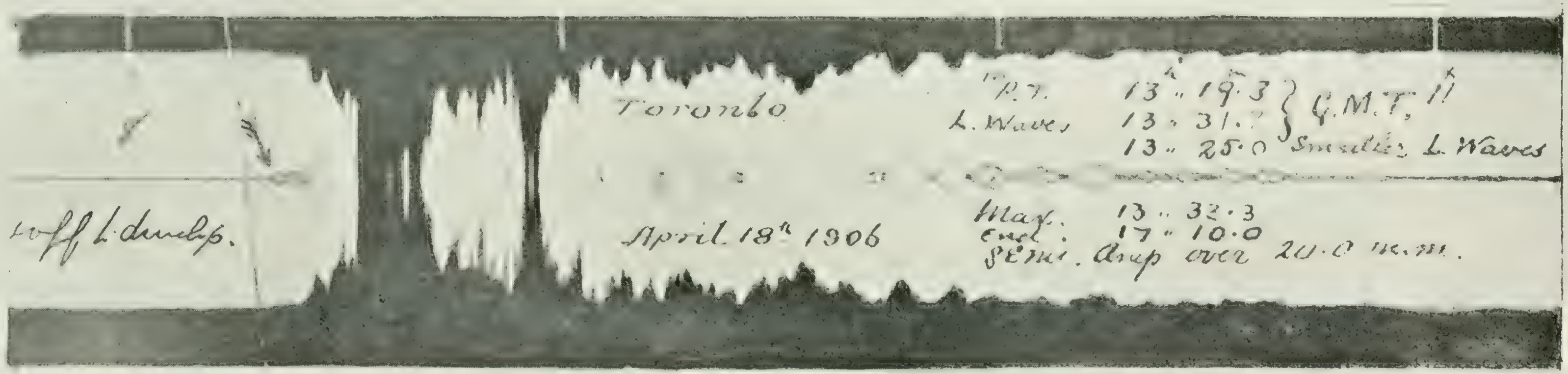
During the past few weeks, several Toronto vessel captains have wired our central office for a two-day forecast before leaving Oswego or Rochester for Toronto or other Ontario ports, and there is good ground for belief that had all others done the same there might have been fewer casualties.

Yours faithfully,

R. F. STUPART.

Director Dominion Meteorological Service.





Seismogram showing Registration of Earth Waves at Toronto and Victoria, B.C., caused by San Francisco, Cal., Earthquake.

Many very severe storms swept over the maritime provinces during the winter months and it is gratifying to be able to state that storm signals never gave better, longer and more reliable warning than for these storms. Comments eulogizing the service appeared in the Halifax and St. John press on many occasions, e.g. : Halifax 'Chronical,' December 11. 1905. 'The storm that swept over the city yesterday was the severest of the season. The storm had been predicted by the meteorological office on Thursday when it was off the coast of Florida, but that it would not affect the maritime provinces before Sunday. On Saturday the Weather Bureau predicted heavy southeasterly gales with snow and rain, and this was verified almost to the letter. No steamers or other crafts—with the exception of the Dartmouth ferry steamer —were running.'

Halifax 'Herald,' December 11, 1905 :

'No disasters were reported last night. Ample warning was given by the Canadian Meteorological Bureau of what was coming. Thirty-six hours before the arrival of the storm it was reported moving up from the Florida coast. Then in Saturday evening's papers the warning of 'easterly gales with sleet or rain was repeated.' It came to the letter, demonstrating the great value of the Weather Bureau, which often before had been proved to be a good thing.'

St. John, N.B., 'Telegraph,' March 21, 1906:

'The timely warning of the storm by the hoisting of the storm signal at the custom house, prevented any vessel from going to sea. Quite a number of coasting vessels are ready to go to their port of destination as soon as the storm abates.'

St. John, N.B., 'Globe,' March 20, 1906 :

'Another of the disturbances from the Gulf of Mexico and southwest states has moved to the maritime provinces. This type of disturbance has been by far the most numerous this season. The storm raging to-day was bulletined Monday morning and signals displayed later in the day. Our meteorological service is making a record that would be difficult to surpass; storm after storm has been accurately and timely forecasted and the warnings given by the bulletins and display of signals, greatly to the advantage and safety of shipping.

Since my last report Port Daniel, Que., has been added to the list of storm signal stations which now number 81, distributed as follows : Three in British Columbia ; thirty-two on the Great Lakes, and forty-six in the maritime provinces. Arrangements are now being made to erect signal masts at Bonaventure River, Que., Corner of the Beach, Que., Point St. Peter, Que., and Gascons, Que.

OUTSIDE STATIONS.

Mr. E. Baynes Reed, assisted by Mr. F. N. Denison, continues in charge of the chief meteorological station in British Columbia and forecasts and storm warnings are issued by them for portions of the Pacific province and these have again shown a percentage of verification highly gratifying. For the compilation of weather charts in Victoria, all the Canadian telegraph reports from Port Arthur westward are transmitted to Victoria, and these together with some United States reports received from Portland, Oregon, form material for a fairly comprehensive weather map. Climatic reports from all stations in British Columbia are likewise compiled and recorded in the Victoria Meteorological Office and hence any information received by agriculturists and others regarding the climate of the province may be obtained in Victoria. Mr. Baynes Reed furnishes the press with most valuable and interesting weekly and monthly reviews which are published in some British as well as the provincial newspapers.

At Banff the self recording instruments on Sulphur mountain have continued in adjustment throughout the year, the records obtained affording data for an instructive comparison between the conditions prevailing on the mountain top and those in the valley 3,000 feet below. These satisfactory results are largely due to Mr. Sanson's zeal in frequently visiting the high station.

Atlin, B.C., and Sable island have been opened as telegraph reporting stations, the list of such stations now being as follows: Dawson, Atlin, Port Simpson, Victoria, New Westminister, Kamloops, Calgary, Edmonton, Medicine Hat, Swift Current, Battleford, Prince Albert, Qu'Appelle, Minnedosa, Winnipeg, Port Arthur, White River, Parry Sound, Southampton, Port Stanley, Kingston, Rockliffe, Ottawa, Montreal, Quebec, Father Point, Anticosti, Belle Isle, Chatham, Yarmouth, Halifax, St. John, Sydney, Charlottetown, St. Johns, Nfld., Sable Island and Bermuda.

It is the observers at these stations who supply the information on which the forecasts and storm warnings are based and inaccuracies in reports whether from ignorance or carlessness, cause much trouble to the forecast officials and are not unlikely to lead to erroneous predictions. The majority of the observers now at telegraph reporting stations are most efficient and reliable, but there are a few weak points which I would like to see strengthened.

Information has been conveyed to me by an inspector that there is some dissatisfaction in the western provinces that in order to obtain climatic statistics, immigrants and would-be settlers are obliged to write to Toronto, whereas had the meteorological service agents, been devoting their whole time to the work of the service in each of the capital cities, Winnipeg, Regina and Edmonton, much time would be saved. I strongly favour such a move and hope that the provision will be made in the next parliamentary appropriation for carrying out this improvement.

INSPECTION OF STATIONS.

The following stations were inspected by Mr. B. C. Webber:—Quebec, Halifax, St. Johns, Newfoundland, St. Georges bay, North Sydney, Sydney, Louisburg, Charlottetown, Murray Harbour, Chatham, Bathurst, Shippegan, Dalhousie, Paspebiac, Ste. Adelaide Pabos, Grand River, Cape Cove, l'Anse au Beaufils, Percé, Barachois de Malbaie, Fox River, Gaspé and Bermuda. At Quebec, clocks and meteorological instruments were examined and the former were found out of adjustment and required cleaning. At Halifax, the time ball apparatus and meteorological instruments were examined and reported upon. At St. Johns and St. Georges bay, the barometers were cleaned and adjusted. At North Sydney, repairs to fence, &c., were ordered. At Charlottetown, a new anemograph was ordered and a new signal shed was constructed. At Chatham the barometer was cleaned and adjusted and the position of the signal mast reported upon. At Bathurst and Shippegan, N.B., the signal masts were moved to new sites. At Dalhousie, a shed for the signals was ordered. At Paspebiac, the painting of the signal mast and repairs were ordered. At Grand River, instruction were given for the repair of the signal shed roof. At Barachois de Malbaie, the agent was instructed as to his duties. At Fox river, instructions for painting the signal house and fence were given and the straightening and painting of mast was ordered. At Prospect, Bermuda, a new site was chosen for the station and a change of observers was made. At other stations recommendations were made for the improvement of their condition.

The following stations were inspected by Mr. W. D. Allan:—Banff, Glacier, Kamloops, Agassiz, Vancouver, Victoria, Saugeen, Pelee Island, Wallaceburg, Ridgetown, Woodstock, Orillia and Collingwood. At Banff instruments were tested both at the Mountain and Valley stations. At Kamloops, the barometer was repaired and compared with standard. At Agassiz, instructions were given for better exposure of thermometers. At Vancouver, the painting of the time gun shed was ordered. At Victoria, the barometer was compared with the standard instrument. At Southampton, instructions were given to obtain tenders for the erection of a signal shed; a new anemometer was installed and the barometer was cleaned. At Wallaceburg, thermometers were placed in position. At Ridgetown, the station was closed and instruments were carried away. At Woodstock a new anemometer was set up, and the painting of the thermometer shed and screen was ordered.

The following stations were inspected by Mr. W. E. Jackson:—Collingwood, Meaford, Owen Sound, Wiarton, Saugeen, Kincardine, Goderich, Bayfield, Pelee Island, Sarnia, Amherstburg, Port Stanley, Sault Ste. Marie and Tobermory. At Collingwood instructions were given for the alteration and repair of the signal shed. At Owen Sound, the signal apparatus was put in order. At Wiarton, Goderich and Southampton, instructions were given for painting the signal masts. At the latter station, the meteorological instruments were also put in order. At Bayfield, instructions were given to obtain tenders for the repairing, painting and removal of mast. At Pelee Island and Port Stanley, the meteorological instruments were put in order. At other stations not referred to, minor instructions were given and suggestions made for the improvement of the observations, &c.

The following stations were inspected by Mr. H. V. Payne:—Arden, Renfrew, Oliver's Ferry, Westport and Port Stanley. At the four first stations mentioned, the rain gauges were examined and reported on. At Port Stanley, instructions were given for the re-erection of the Instrument tower and damaged instruments were returned to store.

Mr. E. Baynes Reed inspected Dawson City, Y.T., and Atlin, B.C. At the latter station instruments were installed and the observer instructed as to his duties.

TIME SERVICE AND SOLAR OBSERVATIONS.

During the year ending June 30, 1906, 61 stellar observations for time were made in the meridian with the transit instrument, also four solar observations were taken. The position of the stars used were those given in the Berliner Jahrbuch. The collimation error of the transit instrument has been determined frequently from micrometrical measurements on the collimating telescope and by reversal on Polaris and other stars. This error still remains almost constant. The mounting of the transit instrument remains in a very satisfactory condition, the variation in the asimuth and level errors being very small.

The time exchanges with Montreal, Quebec, and St. John have been carried on as usual and registered on the chronographs at Toronto, Montreal and St. John. The errors of the Toronto clock and of the time pieces used by the different observers elsewhere are computed from the latest observations. Both the sidereal and mean time clocks of the Toronto observatory with their various electrical appliances have continued to work well and give great satisfaction.

The following table shows the difference between the time by 'Standard Observer' and that given at the various exchanges. The sign indicates that the time sent from the different Observatories is faster than that by 'Standard Observer.' The time by 'Standard Observer' is the arithmetical mean of the times determined at Toronto and Montreal.

1905.	Toronto Sections.	Montreal Sections.	Quebec Sections.	St. John Sections.
July 14	—0.24	+0.24	—0.98	—0.53
August 31	—0.38	+0.38	+0.20	+0.17
September 15	+0.12	—0.12	+0.20	—0.22
" 29	—0.07	+0.07	+0.05	+0.23
October 13	+0.11	—0.11	+0.08	+0.98
November 3	+0.00	.....	—0.41	—0.53
" 24	+0.19	—0.19	—0.44	—0.41
December 8	+0.21	—0.21	+0.93	+0.39
1906.				
January 12	+0.18	—0.18	—4.33	—0.57
" 26	+0.06	—0.06	+0.00	—0.44
February 9	—0.46	+0.46	+1.18	—0.28
" 23	—0.43	+0.43	+2.21	—0.04
March 23	+0.06	—0.06	+0.55	—0.24
April 27	—0.81	+0.81	+0.42	—1.14
May 11	+0.17	—0.17	+0.48	—0.80
" 25	+0.08	—0.08	+1.07	+ .12
June 15	—0.43	+0.43	+0.92	+0.36
" 29	+0.06	—0.06	—0.63	—0.37

With the equatorial telescope the sun spot observations have been continued, maps of the sun's surface four inches in diameter being obtained on 118 days. A large spot with double nucleus followed by small trailing spots appeared on the sun from July 5th until it disappeared around the west limb July 22nd. No group of importance appeared on the sun until October 9th, when a moderate sized spot a little north of the equator appeared, being central on the 14th and disappearing over the west limb on the 20th October. This spot was followed by the largest disturbed area of the year, appearing north of the equator on the east limb October 13th, becoming central October 20th, at which time it presented a fine appearance in the telescope, being composed of several large nuclei with a multitude of small spots and faculæ 100,000 miles long by 75,000 miles wide. A large single spot with a long oblong nucleus followed the large group, appearing on the east limb on October 20th. The large group reappeared at the next revolution but was broken up into fragments and scattered longitudinally over a great extent of the sun's surface. A rather large scattered group of small spots became central on the sun's disk November 30th, from which time until March, 1906, the sun's surface was comparatively free of spots with the exception of a few small ones here and there, although at no time was the sun observed free of spots except on July 27th, 1905. During March and the early part of April, 1906, several scattered and fairly large groups both north and south of the equator were visible, and at the end of year June 30th there were five small groups north of the equator and one south. These spots extended from the eastern limit to the sun's central meridian.

SEISMOLOGICAL OBSERVATIONS.

The Toronto and Victoria Milne Seismographs have been kept in successful operation throughout the year, and some very interesting earth tremors have been recorded. Bromide copies of all important disturbances have been struck off and these, together with a table giving the measurements of all movements small and great, were forwarded to the Seismological Committee of the British Association, London, and to various scientific men interested in Seismological investigation.

There are some forty instruments of a pattern similar to that used in Canada in various countries and the disastrous earthquakes and volcanic eruptions of the past year have given an additional interest to the study of earth movements, as indicated by such instruments.

During the year 102 disturbances, large and small, were recorded at Toronto, and 97 at Victoria. The most important of these occurred on July 9 and 23; January 24 and 31; April 10 and 18. All of these records were caused by violent earthquakes in various parts of the world, but naturally the most interest attaches to the last of the series, as the movement of the pendulums was in response to the tremors and earth billows which originated near San Francisco when that city was destroyed by earthquake. Prints of the seismograms obtained are shown at the end of this report.

THE UNITED STATES WEATHER BUREAU.

In conclusion I desire to place on record my entire appreciation of the very friendly and harmonious relations existing between the Canadian Meteorological Service and the United States Weather Bureau. The exchange of reports continues as heretofore and all communications are characterized by the utmost good will and a most evident desire for mutual co-operation.

All of which is respectfully submitted,

R. F. STUPART,
Director.

APPENDIX A.

METEOROLOGICAL SERVICE, ST. JOHN OBSERVATORY,
ST. JOHN, N.B., September , 1906.

R. F. STUPART F.R.S.C
Director, Meteorological Service.
Toronto, Ont.

SIR,—I have the honour to present my annual report on the St. John Observatory for the fiscal year ending June 30, 1906.

The routine of meteorological observations, records and reports has been continued without change from my previous report. The electric recording and other instruments are in excellent condition and are giving good service.

The morning weather bulletin has been issued on each week day throughout the year. It is posted in prominent places, distributed through the mails and published by the evening newspapers. The information of weather conditions and the Toronto forecasts contained in the bulletin have become a necessity to mariners, shippers and other business interests affected by weather changes. Much favourable comment from the press and otherwise was made on the reliable forecasts and warnings of dangerous gales during the past stormy season. The forecasts and warnings are also sent locally by telephone and frequent requests for information from mariners and others are received and answered at all seasons.

During the year, observations of standard stars were made with the meridian telescope on 107 nights for determination of the errors and rates of the standard sidereal clocks. The observations, clock comparisons and time exchanges have been registered on the chronograph.

The daily time signals have been regularly transmitted, are well known all over the maritime provinces and continue to be most useful to navigators, railways and the general public. Practically all the time pieces of this section of the Dominion are regulated by our standard clock. The telegraphic connections and standard clock being always available, special signals are frequently requested by navigators for rating their chronometers. Time is also sent by telephone to our local chronometers and watchmakers.

By courtesy of the superintendent of the Western Union Telegraph Company here the usual new year's eve signal was transmitted at 6.00 P.M. on December 31, enabling caretakers of public clocks and others to correct their time pieces.

The time balls at St. John and Halifax have been dropped each week day at 1.00 P.M., 60th Meridian time. The clock in St. John post office lobby, which is connected by wire with one of the mean time clocks, has been hourly corrected throughout the year. I understand it is intended to extend this service to other departmental offices.

On August 23 I inspected the time ball apparatus, clocks and electric connections at Halifax. Some slight change was made in the electric clock connections. The clock at Halifax has been synchronized daily without failure and is doing its work well. To keep a check on this clock a return signal during late afternoon or at night is registered on the chronograph here with our standard clock, the error at most times being inappreciable.

The clock room in basement was completed early in the spring. The inner room is plastered on all sides with asbestos cement, lined with sheathing enamelled white. The clock piers are of brick, capped with sandstone. The outside wall is of brick,

leaving about 18 inches of air spaces between the wall and inner room. The Kulberg and Riefler clocks were installed last May. The inner room is kept at an even temperature by means of a Thermostat, Advance Electric Gas burner and pilot light. So far it has been possible to maintain the room within 1 degree of 73 Farh. The glass case of the Riefler clock was hermetically sealed and pressure reduced to 680 mm. by the air pump. Since the temperature has been kept uniform there has been no trouble in maintaining constant pressure in the clock case. This fine clock is now running with almost perfect accuracy. Both clocks are connected by cable with the switch board and chronograph in the office upstairs.

I have the honour to be, sir,
Your obedient servant,

D. L. HUTCHINSON,
Director, St. John Observatory.

APPENDIX B.

QUEBEC OBSERVATORY,
QUEBEC, August, 1906.

The Director,
Meteorological Service, Toronto.

SIR,—

I have the honour to transmit my annual report for the fiscal year ending June 30th, 1906.

The time ball on the citadel is in very good working order, and it was dropped daily during navigation season as heretofore.

All the necessary repairs, which I mentioned in my last report, were made during last winter, before the opening of navigation.

At the observatory the two clocks were cleaned and repaired, also the anemograph which was broken.

I continue to perform the duties of my office as in the past, and the instruments are kept in good working order.

I have the honour to be, sir,
Your obedient servant,

ARTHUR SMITH,
Director.

MAGNETIC OBSERVATORY,
TORONTO, September 19, 1906.

LT.COLONEL F. GOURDEAU,
Deputy Minister of Marine and Fisheries,
Ottawa.

SIR,—

I have to report that during the fiscal year ended June 30th, 1906, there has been no change in the equipment of the observatory.

Mr. William Menzies has been continued in immediate charge of the observatory and makes the following general report regarding the routine work.

The regular photographic curves of declination, horizontal force and basement temperatures have been maintained throughout the year without other loss than twelve hours of the Bifilar curve which was occasioned by the cylinder not being properly in

gear and occurred during my absence in Labrador. These curves have been measured at hourly intervals and at times of the greatest excursion the results tabulated, meaned and reduced to absolute values in C.G.S. units for publication.

The absolute observations of declination, inclination and horizontal force have been taken at stated intervals and results compared with the photographic curves and scale readings of the differential instruments in the usual manner. Special magnetic data and copies of curves have been furnished to directors of foreign observatories and other correspondents, as may have been requested by them. Accurate times have been assured by weekly time exchanges with Toronto observatory.

The usual meteorological observations consisting of maximum, minimum and incidental readings of temperature, anemographic records of wind velocities and directions, measurements of rainfall, state of weather, &c., &c., have been regularly taken.

It having been deemed advisable that magnetic and meteorological records should be obtained at the solar eclipse station at Northwest river, Labrador, both during and prior to the time of totality, application was made to the Dominion Government for permission that an observer with the necessary instruments should accompany the expedition which was to be fitted out under the direction of Dr. W. F. King, the chief Dominion astronomer. The Honourable the Minister of Marine and Fisheries having granted the necessary authority, and Dr. King having accepted the assistance offered, I deputed Mr. William Menzies to accompany the expedition. It was deemed altogether expedient that the various instruments used should be self-recording and should be as follows: A declinometer to show the variations in the declination of the magnetic needle; a Bifilar magnetometer to register the changes in the horizontal component of the earth's magnetism; also a barograph and a thermograph.

In order that the magnetic instruments should record photographically, it was necessary to provide a dark shelter for them, and Mr. Menzies undertook the construction of a suitable shelter and the various mechanical contrivances necessary for adapting our instruments to the peculiar circumstances. Scale values and details of instrumental adjustment were determined by myself. A full description of the shelter and the installation of the various instruments may be found in 'The Transactions of the Royal Astronomical Society of Canada for the year 1905.' Although the sun was obscured during the time of the eclipse and a very pronounced magnetic disturbance made it impossible to detect any eclipse effect on the movements of the magnets, the magnetical records obtained in this northern station during an interval of fourteen days are a valuable contribution to the science of terrestrial magnetism.

Respectfully submitted,

R. F. STUPART,
Director.

APPENDIX No. 5.

REPORT OF THE CHAIRMAN OF THE BOARD OF STEAMBOAT INSPECTION.

CHAIRMAN'S OFFICE,

OTTAWA, November 1, 1906.

To the Deputy Minister of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to submit the annual report of the working of the Steamboat Inspection Service for the year ending June 30, 1906.

It represents the general work of the service during the time stated, giving the number of steamboats inspected in the several divisions and their gross tonnage, with the amount of dues collected from steamers employed in the carriage of passengers between Canadian ports, but registered elsewhere than in Canada, together with the fees received for engineer examinations, the names of the candidates, and their grade of certificate.

In addition to the steamboats inspected at the port of Montreal, the ships' tackle and hoisting gear used for the purpose of loading and unloading those vessels to the number of 423, were also inspected by the steamboat inspectors of that port.

NUMBER of steam vessels reported as known by the inspectors of steamboats in the Dominion, for the year ended June 30, 1906, also the number of steamers inspected but not registered in the Dominion for the same date.

Division.	Number of Dominion registered steamers.	Gross tonnage of Dominion registered steamers.	Number of steamers inspected but not registered in the Dominion.	Gross tonnage of steamers inspected but not registered in the Dominion.
Toronto	316	72,390	39	35,044
Collingwood	190	44,885	14	17,907
Kingston	169	24,688	25	1,977
Montreal	194	22,245	2	6,612
Sorel	91	30,304		
Quebec	114	17,636	4	1,967
Nova Scotia	145	28,662	20	35,062
New Brunswick and P. E. Island	149	22,061	8	7,229
British Columbia and Yukon Territory	267	49,141	29	37,701
Manitoba and North-west Territories	170	13,970	1	681
	1,805	325,982	142	144,180

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NUMBER of Dominion registered steam vessels inspected and their gross tonnage, with amount of fees collected on account of steamboat inspection, during the year ended June 30, 1906.

DIVISION:	Number of Dominion registered steamers inspected.	Gross tonnage of Dominion registered steamers inspected.	Amount of fees collected on account of steamboat inspection.
			$ cts.
Toronto	282	70,911	138 40
Collingwood	176	43,296	45 68
Kingston	163	24,553	
Montreal	174	22,090	
Sorel	80	29,268	
Quebec	110	16,698	165 36
Nova Scotia	129	28,111	2,160 96
New Brunswick and P. E. Island	139	18,886	60 00
British Columbia and Yukon Territory	234	44,214	879 84
Manitoba and North-west Territories	116	10,793	
Engineer certificates	.....	.....	1,012 00
Total	1,603	308,820	4,462 24

BOARD MEETINGS.

April 6, 1906.—A meeting of the Board of Steamboat Inspection composed of Messrs. Dodds, McKean, Stewart, Thompson, Evans, Davis and the Chairman was convened at Toronto to deal with the question of conditions arising, due to the modern steel steamer engaged chiefly in the carriage of freight and carrying a limited number of passengers. To meet these conditions amendments were recommended to the rules relating to the boats to be carried and also the pumps necessary for fire protection.

Rules were also recommended for computing the allowable working pressure on machine made furnaces of the bulb type. These rules were approved by the Governor-in-Council on May 10, 1906, and came in force May 19, 1906.

The question of amending Section I of the rules so as to allow the Inspector discretion in applying the hydrostatic test on boilers was suggested to the Department. This question was submitted to the Board for their consideration, and the unanimous decision was that no such departure or change in the mode of inspecting from that as required by the present rules could be recommended in the interest of public safety.

Prosecutions with penalties enforced for violation of the Steamboat Inspection Act.

July 21, 1905.—A complaint was forwarded the Department that a gasoline yacht was employed at Port Burwell in the carriage of passengers, for hire, without holding the necessary certificate of inspection. The matter was referred to the Collector of Customs at that port to examine into, the result being the vessel was seized and a fine of $50 was imposed and received by the Department.

July 25, 1905.—Steamers *Aileen* of Kingston and *Lee* of Brockville were seized by the Inspector of Hulls and Equipment for violation of the law by carrying more passengers than that allowed by her certificate of inspection. The owners were each subjected to a fine of $100.

August 11, 1905.—The department having been informed that the ferry steamer *Argyle* plying at Kenora, Ont., was running without having a licensed engineer in charge, instructions were issued to the Collector of Customs to ascertain the facts and take action, the result of which a penalty of $100 was imposed and a draft for same was received by the Department.

August 17, 1905.—Complaint having been made to the department of steamers running in the vicinity of Lake Massawippi, P.Q., and carrying passengers illegally, the department took steps to verify same by sending an officer to investigate. The result was legal proceedings were taken against the owner of steamer *Pocahontas,* who paid the penalty of $150 on withdrawal of the prosecution.

October 12, 1905.—Complaint was made that the tug *Togo* was carrying passengers on the Spanish River without holding the necessary certificate of inspection. The Collector of Customs was advised of same, whereon the steamer was seized, the captain pleading guilty, a fine of $50 was imposed.

December 19, 1905.—The Collector of Customs at St. John, N.B., imposed a fine of $50 on the steamer *Wilfred C* of Halifax for an infraction of the Steamboat Inspection Act by running without having the necessary certificate of inspection for the current year, which fine was remitted to the department.

July 30, 1906.—A fine of $100 was imposed by the Collector of Customs at St. John, N.B., on the Norwegian steamship *Veritas* for an infraction of the Steamboat Inspection Act, by carrying cargo between two Canadian ports without being inspected; a draft for same was received by the department.

CASUALTIES.

The following are the casualties reported from the several divisions as having occurred during the year ending June 30, 1906.

TORONTO DIVISION.

August 9, 1905.—The steamer *Erin,* of St. Catharines, while passing through the Detroit river, when abreast of Sandwich, broke the connecting rod, the piston carrying away the intermediate head between the high and low pressure cylinders, also the top head flange of high pressure cylinder and throttle valve. The escaping steam from the steam pipe caused the death of the assistant engineer who was on duty at the time.

September 19, 1905.—While the steamer *Melbourne,* of Port Stanley, was lying at the Bay of Quinte entrance to Murray canal, she took fire and was totally destroyed. Cause of fire unknown.

April 30, 1906.—The tug *Clipper,* of Toronto, en route from Midland to French river, sprang a leak when near the Bustard islands and foundered. The crew numbered four, of which only one reached shore in safety. The vessel has been raised and rebuilt and is again in commission.

May 31, 1906.—Steamer *Erin,* of St. Catharines, when about opposite Courtright, on the St. Clair river, was run into by the United States steamer *Jno. B. Cowle,* and instantly sank and three of her crew were drowned. The steamer has been abandoned.

COLLINGWOOD DIVISION.

August 12, 1905.—The screw tug *Gertie C.,* of Toronto, was destroyed by fire at Dyer's bay, Ont. No casualties.

September 5, 1905.—The steamer *Shamrock,* of Collingwood,was in collision with United States steamer *Richardson* near Point aux Pins, which resulted in the sinking of the steamer *Shamrock* and the drowning of the master and engineer. The steamer has since been raised and repaired.

September 12, 1905.—The screw tug *A Seaman,* of Toronto, was burned near Cape Croker. No casualties.

October 2, 1905.—The screw tug *Signal,* of Collingwood, was destroyed by fire near Midland. No casualties.

November 1, 1906.—The fishing tug *Surprise* of Sault Ste. Marie, was burned at Cook's bay. No casualties.

November 17, 1905.—The tug *W. J. Martin,* of Midland, was burned at Twelve Mile bay. No casualties.

KINGSTON DIVISION.

On the night of July 11, 1905, the steamer *Ellen,* while lying at the dock at Cardinal, Ont., took fire, totally destroying her upper works, which were rebuilt immediately. Cause of fire unknown, there being no person on board at the time.

On June 9, 1906, the steamer *Argyle,* while on a trip from Oshawa to Toronto, broke her main crosshead guide, and side link, also bending the piston rod; she was towed to Toronto and repaired. No loss of life occurred.

On the night of June 14, 1906, the steamer *Manita,* while lying at her dock at Bobcaygeon, was partially destroyed by fire. There being no person on board at the time, cause of fire is unknown. The steamer was immediately rebuilt and placed again in commission.

MONTREAL DIVISION.

March 17, 1906.—The steamer *Sovereign,* of Montreal, 637 gross tons, while lying in winter quarters at Lachine, took fire during the night and was totally destroyed. There were a few carpenters working on board during the day, and it is supposed the origin of the fire was through carlessness on their part.

QUEBEC DIVISION.

Casualty returns, nil.

NEW BRUNSWICK AND PRINCE EDWARD ISLAND DIVISION.

November 19, 1905.—The steamer *Clifton,* of St. John, N.B., gross tonnage, 138, while lying at Reed's point wharf, Kingston, N.B., caught fire and became a total loss. The fire is supposed to have originated from the furnaces.

March 16, 1906.—The passenger steamer *Beatrice E. Waring,* of St. John, N.B., 593 gross tonnage, while lying at her wharf in winter quarters, caught fire from some unknown cause and was totally destroyed.

May 18, 1906.—The piston rod of steamer *Neptune* broke, due to an old flaw developing where fitted into cross-head, the piston carrying away broke the flange off the top end of the cylinder. A new rod and cylinder were fitted at St. John, N.B.

NOVA SCOTIA DIVISION.

August 18, 1905.—On steamer *Halifax* one of the fore-and-aft stays below furnaces broke without warning, close to inside of the head sheet of port boiler, blowing out the piece attached to nut, allowing the stay to drop down when the stoke hold was filled with boiling water, causing the death of one fireman; the stay, upon examination, showed an old fracture, which was impossible to detect prior to the accident.

December 4, 1905.—The SS. *Lunenburg,* of Lunenburg, N.S., 266 tons gross, while on a voyage between Pictou and Magdalen islands, was stranded on Grindstone island and became a total loss, twelve of the passengers and crew being drowned.

January 9, 1906.—SS. *Richards* of Montreal, 466 tons gross, on a voyage between Hastings and Yarmouth, N.S., was stranded near Cape Blanche and became a total loss. No lives were lost.

March 10, 1906.—SS. *Baines Hawkins,* of Sydney, N.S., 703 tons gross, on a voyage from Port Morien to Halifax collided with ice near Scattarie island and sank shortly after, one of the crew being lost.

April 26, 1906.—The steamer *Havana,* of Windsor, N.S., while lying at anchór after dark in Halifax harbour, was run into by the steamer *Strathcona* and sank in a few minutes, becoming a total loss. No lives were lost.

June 2, 1906.—The steamer *Florence C.*, of Halifax, 39 tons gross, while attempting to enter Tor Bay, N.S., was stranded and became a total loss. No lives lost.

MANITOBA AND NORTHWEST TERRITORIES DIVISION.

October 7, 1905.—The steamer *Monarch,* 113 gross tonnage, while lying at her dock at Rainy River, was partially burned. The machinery has been taken out and boat put out of commission. Cause of fire not known.

August 19, 1905.—Steamer *D. A. Gordon* 148 gross tons, while lying at Canadian Northern dock, Port Arthur, at 4 a.m., caught fire and was partially burned. The machinery has been taken out and hull converted into a barge. Cause of fire unknown.

March 31, 1906.—Steamer *Kaministiquia,* of 150 gross tons, while lying in her winter quarters at Port Arthur, caught fire and was burned to the main deck, at the hour of 11.00 P.M. It is supposed to have been done by tramps taking shelter on board; the boat has since been rebuilt and put into commission again.

BRITISH COLUMBIA AND YUKON TERRITORY DIVISION.

April 4, 1906.—SS. *Selkirk,* of Victoria, B.C., 142 gross tons, stranded on Jones island at 4 A.M. Two days afterwards she filled with water and sank in ten fathoms; she was subsequently raised, brought to Victoria and put in a seaworthy condition, after which she again went into commission June 30.

The stern-wheel steamer *Cheam,* of New Westminster, B.C., 286 gross tons, employed in towing on the upper Fraser river, was wrecked by running on a snag. The water was falling at the time, the result of which the vessel broke in two.

I am, sir, your obedient servant,

E. ADAMS,
Chairman Board of Steamboat Inspection.

APPENDIX No. 6.

ANNUAL REPORT OF THE SIGNAL SERVICE, 1905-06.

REPORT received from Mr. J. U. Gregory, Agent, Department of Marine and Fisheries relating to the Signal Service for the year ending June 30, 1905.

OFFICE OF THE SUPERINTENDENT,
QUEBEC, November 14, 1906.

As in previous years, reports have been received from the different signal stations in the river and gulf of St. Lawrence, recording the weather, wind and condition, location and movement of the ice during the winter and spring months, and during the season of navigation all inward and outward bound vessels, as signalled when passing each station. These reports have been distributed to the Boards of Trade at Montreal and Quebec, and to the Chamber of Commerce at Halifax, also to the press of Montreal and Quebec, to the agent of the Department of Marine and Fisheries at Quebec, Custom House, Immigration Department, steamship agents, tug owners, pilots, Lloyds' agents and a great many others. The superintendent of the quarantine station at Grosse Isle is also supplied with full information as to weather and wind, and the incoming of all transatlantic or foreign vessels, and the quarantine doctor at Rimouski with reports of the incoming mail steamers, names of stations and hours of passing same. Information was also supplied from this office, as in past seasons, to the signal agents at Anticosti, Magdalen Islands, Meat Cove, Cape Ray and Cape Race during April and May in regard to the weather, wind, and condition and movement of the ice in the river and gulf of St. Lawrence for the guidance of vessels calling for information. During the first ten days of March the Deputy Minister of Marine at St. Johns, Newfoundland, was supplied with information of the weather, wind and location of ice by the signal agents at Anticosti, Magdalen Islands, Meat Cove, St Paul's Island, Cape Ray and Belle Isle, for the guidance of the Newfoundland sealing fleet.

All vessels showing their distinguishing signals are reported by the different signal stations immediately, and such reports are promptly posted on the bulletin boards of the Great Northwestern Telegraph Company at Quebec and Montreal. The signalling of vessels has been greatly facilitated by the establishment of Marconi wireless telegraph at different points in the river and gulf of St. Lawrence, although the number of vessels fitted with the wireless system is small as yet.

HERBERT S. McGREEVY,
Superintendent of Signal Service.

CITADEL SIGNAL STATION HALIFAX—YEARLY

Year and Month.	British Men of War.			Foreign. Men of War.			1st Class Steamers.			2nd Class Steamers.		
	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.
1905.												
July							18	18	.....	81	81	4
August							22	22	1	85	85	3
September	6	6	.....	.....	.....	.....	33	33	.....	73	73	2
October							24	24	10	88	88	8
November	2	2	.....	.....	.....	.....	36	36	5	72	72	7
December	1	1	.....	.....	.....	.....	42	42	3	69	69	5
1906.												
January	1	1	.....	.....	.....	.....	43	43	1	47	47	2
February							35	35	.....	27	27	2
March							59	59	.....	39	39	2
April	1	1	.....	.....	.....	.....	51	51	2	47	47	3
May	1	1	.....	1	1	.....	30	30	2	57	57	3
June	3	3	.....	.....	.....	.....	40	40	3	73	73	5
Yearly total...	15	15	.....	1	1	.....	443	443	27	758	758	46

Halifax, N.S., Aug. 20, 1906.
August 20, 1906.

E. WORTHINGTON, *Sergt. R.C.R.,*
Assistant Director of Signals.

SESSIONAL PAPER No. 21

REGISTER OF SHIPPING AS PER RECORD FOLIOS.

Ships and Barques.			Barquentines.			Brigs.			Brigantines.			Schooners, 3-Masted and Bearing Private Signals.			Monthly Totals.		
Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.	Reported.	Arrived.	Passed.
1	1	.....	2	2	....	....	....	....	....	....	....	7	7	.....	109	109	4
1	1	.....	4	4	....	1	1	....	2	2	....	5	5	.....	120	120	4
.....	.....	.....	....	....	....	....	....	....	....	....	....	6	6	.....	118	118	2
2	2	.....	2	2	1	1	1	....	....	....	....	5	5	.....	122	122	19
1	1	.....	1	1	....	....	....	....	....	....	....	7	7	.....	119	119	12
.....	.....	.....	1	1	....	....	....	....	1	1	....	2	2	.....	116	116	8
.....	.....	.....	1	1	....	....	....	....	1	1	....	1	1	.....	94	94	3
.....	.....	.....	....	....	....	1	1	....	....	....	....	2	2	.....	65	65	2
.....	.....	.....	....	....	....	2	2	....	....	....	....	4	4	.....	104	104	2
.....	.....	.....		2 2	....	1	1	....	....	....	....	3	3	.....	105	105	5
.....	.....	.....	1	1	....	....	....	....	2	2	....	8	8	.....	110	110	5
3	3	.....	1	1	....	....	....	....	1	1	....	9	9	.....	130	130	8
8	8	.....	15	15	....	7	7	....	6	6	....	59	59	.....	1,312	1,312	74

J. S. SHARPE, *Lt. R.C.E.,*
D.O.EC.

APPENDIX No. 7.

REPORT OF MARINE SCHOOLS.

OTTAWA, CANADA, May 21, 1906.

The Deputy Minister of Marine and Fisheries,
Ottawa, Ont.

I have the honour to submit the annual report upon the various marine schools established at the following shipping centres of the Dominion:—

Victoria, B.C.
Kingston, Ont.
Montreal, P.Q.
Quebec, P.Q.
North Sydney, N.S.
Halifax, N.S.
Lunenburg, N.S.
Yarmouth, N.S.
St. John, N.B.

The establishing of marine schools where seafaring men could gather more knowledge about the various subjects pertaining to this calling, was first instituted during the winter of 1903-4, when schools at the following places were opened:—Victoria, Halifax, St. John and Yarmouth. During the season of 1904-5, the number of schools were not increased, as the idea was still in its infancy.

Owing to the encouragement received, the department determined to open schools at Kingston, Montreal, Quebec, North Sydney and Lunenburg; all these schools were well attended, particularly at Kingston and Quebec.

The programme of subjects discussed was uniformed and based upon the system which had been followed at the marine school at Montreal, when under the auspices of the Société St. Jean Baptiste. Each school has been supplied with the most necessary objects for demonstration, but owing to the short notice which was given me to control these schools, the complement of furnishings has not yet been supplied. The lecturers at these schools are, but with one exception, the examiners of masters and mates, who are fully qualified to discuss maritime affairs.

During this season's lectures, special attention has been paid to the explanation of the 'rule of the road' and the deviation and correction of compass, which are the most important technical subjects of a navigator's education.

These schools have been extremely beneficial, especially to our sailors navigating fresh waters; they are also appreciated by foreign-going navigators, but not to such an extent as in the case of fresh water sailors; explanations of the various subjects are necessarily of an elementary nature.

The schools were not established for the purpose of preparing or coaching candidates for the various examinations, but to give those who follow or intend to follow the sea an insight into the various technical subjects which come under the heading of seamanship.

The teaching given at these schools will tend to raise the efficiency of our inland navigators to a satisfactory degree and I fully anticipate similar results with deep water navigators.

A statement showing the amount of attendance is herewith attached. It will be seen by the statement that the total attendance was 3,954 persons, which is certainly encouraging and in view of the results already achieved, I would recommend that schools be opened at the following places:—Toronto, Vancouver, Charlottetown or Pictou; Windsor or Sarnia; and Goderich or Collingwood.

ATTENDANCE.

Schools.	Lecturers.	No. of Lectures.	Min.	Max.	Average.	Total Attendance.
Victoria, B.C.	Capt. Jas. Gaudin.	25	3	13	7	172
Kingston, Ont.	Capt. T. Donnelly.	31	20	112	68	2,108
Montreal, P.Q.	Capt. J. J. Riley.	38	1	15	7	240
Quebec, P.Q.	W. Seaton, Esq.	16	17	34	26	408
N. Sydney, N.S.	Cap. J. Sutherland.	30	5	17	10	288
Halifax, N.S.	Commander E. B. Tinling.	25	3	23	13	308
Yarmouth, N.S.	Cap. J. E. Murphy.	28	1	19	10	258
St. John, N.B.	Capt. R. C. Cole.	21	2	9	9	172
Lunenburg, N.S.	Capt. H. Hebb.		No data available.			

L. A. DEMERS,

Superintendent of Marine Schools.

APPENDIX No. 8.

General Summary of Expenditure for Fiscal Year 1905-6.

Service.	Amount.	Total.
	$ cts.	$ cts
Ocean and River—		
Maintenance and repairs to Dominion steamers	587,885 89	
Examination of masters and mates	7,068 15	
Rewards for saving life, &c	11,991 43	
Investigations into wrecks	7,476 07	
Schools for navigation	5,036 29	
Naval militia	9,135 87	
Registry of shipping	1,800 00	
Removal of obstructions in navigable rivers	4,967 18	
Tidal service	28,047 77	
Winter mail service	16,680 58	
Marine biological station	2,914 03	
Cattle inspection	3,335 52	
Wrecking plant, St. Lawrence River and British Columbia	25,000 00	
Hudson's Bay	77,707 52	
Hudson's Bay patrol boats	55,000 00	
Ice-braeking steamers	164,414 93	
Unforeseen expenses	3,765 17	
A. Shaw	39 33	
		1,012,265 73
Lighthouse and Coast—		
Salaries and allowances of light-keepers	262,403 64	
Agencies, rents and contingencies	29,739 50	
Maintanance and repairs to lights	531,920 43	
Repairs to lightships	23,560 00	
Construction and apparatus including Lake St. Peter	1,605,778 59	
Signal service	8,184 39	
Marconi stations	83,033 87	
Submarine signal apparatus	50,547 60	
Administration of pilotage	12,066 42	
Repairs to wharfs	2,960 47	
Salaries of temporary clerks	19,947 01	
Parry Sound buoy depot	11,711 17	
Compensation to families *re* explosion of gas buoys	38,686 49	
Wates system, Partridge Island	2,957 37	
		2,688,496 95
Scientific Institutions & Hydrographic Surveys—		
Magnetic observatory, Toronto	2,872 96	
" " Montreal	500 00	
Meteorological service	99,719 52	
Hydrographic surveys	120,349 69	
" " str. *Atlantic coast*	45,500 00	
" " str. *Pacific coast*	370 01	
		269,312 18
Ship channel		587,957 51
New dredge No. 15	150,001 32	
" "*Galveston*"	159,847 89	
		309,849 21
Marine hospitals and sick seamen	50,120 42	
Shipwrecked and distressed seamen	598 91	
		50,719 33
Steamboat inspection		37,590 22
Parliamentary returns		485 11
John Bart, gratuity *re* accident on "*Lansdowne*"	200 00	
John Beattie, for damages to property by hydrographic survey engineers	50 00	
Widow late N. Lavoie	166 66	
Parents late E. Richard	200 00	
		616 66
Total, Marine Branch		4,957.292 90

Appendix No. 8.—General Summary of Expenditure for Fiscal Year 1905-6—*Concluded.*

Service.	Amount.		Total.	
	$	cts.	$	cts.
Civil Government, salaries	88,453	31		
" contingencies	19,506	45		
			107,959	76
Total, Fisheries Branch			968,375	09
Grand Total of Expenditure			6,033,627	75

F. GOURDEAU,

Deputy Minister of Marine and Fisheries.

A. W. OWEN,

Accountant.

STATEMENT of Expenditure by the Marine Department

—	1868.	1869.	1870.	1871.
	$ cts.	$ cts.	$ cts.	$ cts.
Maintenance of lights—				
Above Montreal	40,561 28	42,306 69	46,289 05	44,054 01
Montreal District	23,053 56	25,762 54	21,669 49	22,453 52
Below Quebec	45,615 35	41,651 73	43,730 61	31,582 75
Nova Scotia	46,460 72	56,394 88	43,682 86	76,230 77
New Brunswick	20,488 00	23,893 00	27,485 14	20,542 29
Prince Edward Island	.....	.....	.....	.....
British Columbia	.....	.....	.....	.....
Construction—				
Above Montreal	3,136 15	.....	2,976 83	8,770 55
Quebec	7,323 75	7,492 59	1,543 06	.....
Nova Scotia	22,041 42	6,905 80	18,967 23	10,948 31
New Brunswick	.....	.....	11,555 91	8,735 73
Prince Edward Island	.....	.....	.....	.....
British Columbia	.....	.....	.....	.....
Dominion Steamers—				
Quebec	69,026 73	37,176 02	34,549 49	59,797 05
Nova Scotia	14,778 92	26,603 94	19,759 96	13,139 86
New Brunswick	.....	.....	.....	.....
Prince Edward Island	.....	.....	.....	.....
British Columbia	.....	.....	.....	.....
Examination of masters and mates	.....	.....	908 12	1,407 66
Hudson Bay expedition	.....	.....	.....	.....
Investigation into wrecks	.....	.....	140 00	.....
Marine Hospital, Quebec	19,977 36	19,221 45	21,618 73	19,823 18
Marine Hospitals	1,070 86	15,615 71	15,652 62	15,728 93
Meteorological service	8,200 00	8,950 00	8,950 00	9,370 82
Registration of Canadian Shipping	.....	.....	.....	.....
Removal of obstructions	.....	.....	2,350 07	1,000 00
Rewards for saving life	.....	.....	.....	.....
Signal service	.....	.....	.....	.....
Steamboat inspection	7,106 93	7,999 00	7,396 96	8,321 00
Survey, Georgian Bay	.....	.....	.....	.....
Water Police, Montreal	27,445 35	10,238 71	9,323 31	8,030 00
Water Police, Quebec		12,633 59	9,038 62	9,379 73
Civil Government	15,083 88	18,064 25	19,401 05	20,220 96
Steam communication—				
Between Quebec and Maritime Provinces	.....	.....	.....	.....
Between Prince Edward Island and Mainland	.....	.....	.....	.....
Purchase of steamers to replace—				
Glendon	.....	.....	.....	.....
Lady Head	.....	.....	.....	.....
Winter mail service, Prince Edward Island	.....	.....	.....	.....
Tidal observations	.....	.....	.....	.....
Gratuities	.....	.....	.....	.....
Survey, Burrard Inlet	.....	.....	.....	.....
Export cattle trade	.....	.....	.....	.....
	371,070 56	360,899 90	36,212 91	389,537 12

SESSIONAL PAPER No. 21

from Confederation to June 30, 1906.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
57,609 16	61,036 47	60,798 75	71,937 18	68,344 18	65,421 00	73,175 11	'74,587 78	65,518 61
22,369 00	31,143 14	20,939 13	15,000 00	12,999 48	15,998 00	15,996 00	14,917 95	16,523 88
41,936 00	65,645 00	102,056 09	110,362 00	98,792 93	89,980 41	96,904 00	93,178 61	96,703 87
67,806 24	100,953 80	114,711 91	114,344 51	143,125 56	128,496 00	132,888 95	120,951 33	116,189 60
23,369 12	29,266 85	53,439 04	60,119 02	62,551 61	50,998 00	58,989 00	57,499 02	61,252 82
.....	.....	3,357 71	12,584 64	13,730 53	11,817 00	16,986 66	12,158 72	15,288 17
.....	13,207 09	18,519 50	15,983 72	17,175 97	15,853 00	18,948 78	15,152 73	15,576 99
6,940 45	18,999 38	24,461 86	14,286 65	13,320 40	16,267 98	7,207 96	11,993 75	13,297 81
57,818 35	39,303 87	41,950 82	19,325 00	24,336 47	12,945 29	12,776 47	4,154 58	7,797 75
34,760 12	90,181 79	51,867 94	43,898 63	42,214 55	25,550 00	13,500 00	17,386 97	7,069 01
9,561 14	16,691 06	31,572 60	8,842 97	17,819 85	7,083 82	12,028 13	22,598 14	4,985 53
.....	.....	.....	.....	11,829 61	17,752 00	2,504 47	2,560 88	6,074 50
.....	.....	4,353 93	8,799 07	8,477 67	29 66	.....	.....	.....
47,500 00	51,758 05	64,490 00	79,043 70	62,971 49	49,987 66	42,683 00	44,972 79	49,318 93
20,999 63	24,999 57	30,008 99	22,992 62	133,826 08	38,739 39	43,027 00	42,016 53	49,438 93
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	16,241 26	61,782 63	28,933 63	16,332 05	14,429 52
12,115 96	15,984 72	10,555 67	41,796 74	10,156 56	16,095 90	12,193 40	7,460 68	9,733 34
4,312 07	6,466 18	4,520,19	5,696 62	4,672 08	4,050 00	4,249 76	4 250 12	4,253 43
.....	.....	.....	.....	.....	.....	.....	.....	.....
874 00	1,068 89	2,313 31	366 00	466 41	342 65	500 00	1,691 00	676 73
21,000 00	21,000 00	20,456 45	21,994 75	23,795 85	19,965 97	19,987 50	20,791 77	12,991 23
53,536 16	27,150 43	45,986 87	37,111 67	37,155 72	42,449 55	37,487 10	37,445 57	35,040 00
12,618 15	18,830 54	36,700 59	33,580 00	45,560 03	44,871 38	46,050 24	45,706 13	45,554 51
.....	.....	272 30	1,096 46	412 06	842 14	1,435 10	239 26	257 75
.....	.....	.....	450 00	.....	203 00	462 00	305 86	825 00
2,284 32	1,975 13	4,931 78	3,552 86	2,292 20	1,958 55	4,071 00	2,533 10	2,263 15
.....	.....	1,000 00	.....	.....	.....	.....	.....	.....
8,500 00	13,266 00	10,291 58	12,200 00	13,081 86	13,073 01	13,228 38	13,076 46	11,854 34
.....	.....	.....	.....	.....	.....	.....	.....	.....
10,000 00	14,453 87	12,370 86	13,395 00	14,090 00	13,524 29	14,062 00	13,462 74	13,131 06
10,348 00	18,200 00	26,526 66	24,500 00	27,136 68	21,482 08	23,498 06	23,023 26	22,094 48
22,644 52	25,336 04	30,087 23	31,326 18	32,789 18	32,304 12	32,682 05	36,610 19	35,083 95
.....	.....	15,000 00	10,000 00	10,000 00	.....	.....	.....	.....
.....	.....	.....	.....	750 00				
518,958 49	706,817 92	845,150 90	844,586 09	970,146 27	820,054 38	786,156 23	755,359 47	723,360 89

STATEMENT of Expenditure by the Marine Department

	1881.	1882.	1883.
	$ cts.	$ cts.	$ cts.
Maintenance of lights—			
Above Montreal	65,541 21	71,048 50	70,116 68
Montreal District	14,326 36	21,643 05	22,260 32
Below Quebec	89,781 29	91,098 66	102,784 99
Nova Scotia	128,918 59	137,846 15	150,793 17
New Brunswick	63,921 90	66,073 00	75,946 92
Prince Edward Island	12,997 36	16,985 72	17,907 27
British Columbia	17,570 72	17,803 00	18,349 06
Cape Race			
Construction—			
Above Montreal	14,180 02	13,581 00	9,782 27
Quebec	7,539 76	3,731 31	9,672 55
Nova Scotia	7,757 52	13,355 00	9,422 70
New Brunswick	4,578 52	2,253 80	1,022 57
Prince Edward Island	8,150 06	3,092 00	1,934 49
British Columbia	8,655 39	3,237 90	1,005 26
Queen's Printer			
Dominion steamers—			
Quebec	64,973 00	44,923 98	45,156 13
Nova Scotia	36,700 00	31,049 74	37,841 07
New Brunswick			
Prince Edward Island	15,139 95	23,911 97	19,680 00
British Columbia	11,788 09	8,504 61	25,484 00
Department			
Examination of masters and mates	3,888 41	3,981 00	4,021 20
Hudson's Bay expedition			
Investigation into wrecks	310 48	863 19	875 64
Marine Hospital, Quebec	19,964 33	19,938 12	19,998 53
Marine hospitals	32,218 94	33,162 45	29,880 78
Meteorological service	46,163 54	47,464 07	51,990 25
Registration of Canadian shipping	607 43	2,013 28	168 84
Removal of obstruction	150 00	1,116 51	35 80
Rewards for saving life	1,806 13	2,212 00	2,534 60
Signal service			3,365 33
Steamboat inspection	12,211 65	14,835 00	16,209 00
Hydrographic surveys			77 81
Water Police, Montreal	21,953 26	21,994 74	15,798 24
Water Police, Quebec	13,497 81	20,221 82	22,520 41
Civil Government	36,447 50	36,789 46	37,988 39
Steam communication—			
Between Quebec and Maritime Provinces			
Between Prince Edward Island and Mainland			
Repairs to wharfs			
Purchase of steamers to replace—			
Stanley			399 55
Glendon			
Lady Head			
Winter mail service, Prince Edward Island			
Tidal observations			
Gratuities			
Survey, Burrard Inlet			
Export cattle trade			
Survey, Bay of Quinte			
Relief of distressed Canadians			
Manning ships			
Widow of late A. Warren			
McDonald Bros			
Parliamentary returns			
Investigating effect of Chicago drainage canal			
John McDonald			
Longitude, Montreal			
Marine biological station			
	761,730 62	774 831 53	825,010 82

from Confederation to June 30, 1906—*Continued.*

1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.
$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
70,788 27	70,697 89	85,713 98	75,690 74	85,588 70	72,721 23	84,035 65	93,180 72
22,946 43	23,262 94	33,289 28	16,735 49	17,510 17	12,285 79	118,750 70	122,471 89
101,302 35	118,856 94	131,095 29	131,540 80	108,278 67	112,690 20		
142,909 72	137,439 40	143,153 24	117,708 53	133,009 92	140,197 15	139,459 56	139,916 83
86,670 70	92,130 28	76,046 63	96,425 28	73,465 49	78,285 79	61,608 91	61,089 31
19,059 62	20,218 83	22,282 52	17,852 13	14,796 62	19,118 51	16,968 80	19,000 46
18,107 54	15,497 76	14,783 75	16,230 43	19,604 63	16,877 12	16,411 49	19,595 22
....	....	....	4,453 25	5,124 20	7,358 01	....	....
18,432 63	27,977 42	36,678 16	18,383 20	6,341 97	8,623 76	23,863 09	9,796 28
3,168 48	4,354 87	5,877 84	1,260 00	2,287 86	12,203 06		3,723 14
12,489 35	4,352 42	5,905 17	5,330 89	5,533 48	6,039 91		4,596 94
2,868 70	7,667 42	2,421 66	5,280 75	1,542 61	2,966 36		208 16
2,158 60	879 40	....	384 60	....	....		410 00
2,830 38	5,223 11	4,942 70	321 84	5,918 00	1,890 00		14,417 25
....	....	....	26 58	....	40 14		....
43,019 13	51,092 98	51,485 03	50,714 52	150,659 19	126,629 33	114,956 20	111,437 03
27,726 60	42,921 27	30,283 27	32,287 10				
....	....	24,633 26	14,337 23				
19,539 52	33,962 54	20,927 58	19,987 67				
16,111 83	12,485 07	13,430 69	10,809 07				
....	....	....	13,288 83				
5,580 79	6,656 44	5,239 28	4,858 98	5,063 96	4,381 04	4,177 83	4,255 24
480 69	71,374 69	35,217 10	14,762 61	165 00	....	....	....
830 12	385 15	592 63	520 14	513 91	516 67	888 94	1,172 77
19,990 34	19,996 68	16,047 95	19,706 96	18,777 62	18,643 14	10,279 08	751 75
31,401 30	45,371 29	32,229 02	32,545 35	30,667 67	33,089 20	31,450 03	33,303 37
56,418 16	56,625 40	56,898 33	57,140 74	59,986 10	58,577 07	58,452 10	62,457 10
189 27	237 88	157 13	233 13	897 02	179 21	647 52	1,207 07
342 76	2,259 21	1,237 34	4,190 83	2,500 94	3,603 65	5,737 26	3,633 65
2,614 91	5,221 15	8,147 22	7,363 94	6,825 48	5,503 44	8,150 92	4,952 20
6,704 17	3,881 05	4,622 00	5,082 17	4,441 59	5,092 54	4,976 80	4,700 79
21,893 28	23,235 04	21,775 57	22,847 57	21,430 45	22,213 03	20,989 52	22,183 76
26,745 54	20,454 68	17,759 36	21,592 55	19,424 14	17,808 46	17,969 23	17,677 51
19,021 93	17,683 59	20,933 75	17,413 47	18,725 95	16,948 82	13,164 00	573 80
22,958 79	20,399 33	22,922 82	22,935 65	18,553 57	14,698 68	8,620 61	7,279 85
38,775 00	29,900 83	30,453 57	37,193 62	32,728 78	43,501 96	42,835 78	42,253 67
....	....	....	....	....	....	....	....
....	....	....	....	....	143,505 60	....	....
....	....	....	....	....	....	....	....
56,164 71	47,238 03	....	....	....	....	....	....
....	....	....	....	....	....	....	....
....	....	5,985 42	6,312 93	....	....	....	....
....	....	....	....	7,740 25	1,842 47	2,752 67	7,012 70
....	....	....	....	....	....	244 75	1,888 71
....	....	....	....	....	200 00	80 00	1,025 00
....	....	....	....	....	....	....	1,690 12
....	....	....	....	....	....	....	520 85
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....	....	....	....	....	....	....	....
927,241 61	1,129,901 14	980,120 59	917,557 31	883,250 85	1,023,801 34	807,417 53	885,410 11

STATEMENT of Expenditure by the Marine Department

	1892.	1893.	1894.	1895.	1896.	1897.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Maintenance of lights—						
Above Montreal	87,033 61	87,598 15	78,090 69	82,541 16	82,256 28	80,961 06
Montreal District						
Below Quebec	116,531 27	120,404 19	124,348 80	124,763 81	124,143 66	126,186 00
Nova Scotia	148,815 26	150,445 26	137,339 73	140,977 53	123,234 65	124,671 19
New Brunswick	66,886 69	71,079 46	59,917 96	69,654 46	63,018 64	56,771 02
Prince Edward Island	17,069 98	16,819 64	15,569 39	17,976 67	17,988 15	16,429 23
British Columbia	26 858 68	24,413 27	27,240 77	21,734 18	24,770 44	25,679 52
General account						
Construction—						
Above Montreal	21,704 05	8,766 62	12,581 15	2,699 40	11,993 84	9,527 84
Quebec	809 27	10,097 18	4,743 13	3,004 14	3,300 30	296 26
Nova Scotia	1,965 16	4,381 24	3,104 77	4,737 03	1,842 94	61 71
New Brunswick	1,845 35	1,271 15	115 45	1,597 80	200 00	1 60
Prince Edward Island	1 56	2,958 61	1,604 00			452 90
British Columbia	9,478 81		6,356 43	180 83	225 50	569 99
Lake St. Peter						
New dredge						
Dominion steamers—						
Quebec						
Nova Scotia						
New Brunswick	145,899 61	163,097 46	178,183 97	169,661 64	145,315 28	136,940 11
Prince Edward Island						
British Columbia						
Naval Schools						
Examinations of masters & mates	6,363 88	4,116 99	3,745 33	2,757 29	4,062 82	3,536 29
Hudson's Bay expeditoin						19,091 32
Investigation into wrecks	603 21	643 49	850 81	351 15	483 98	565 25
Lighthouse depot,Georgian Bay						
Marine hospitals	34,106 83	35,757 07	38,403 94	38,589 05	36,682 96	37,984 71
Meterological service	67,138 06	64,165 60	66,440 96	64,588 34	66,600 29	67,397 71
Registration of Canadian shipping	462 59	1,476 19	394 00	207 40	517 60	531 55
Removal of obstructions	2,878 68	1,554 53	202 02	2,217 36	456 38	631 86
Rewards for saving life	6,398 93	7,432 64	8,014 67	6,591 34	8,004 38	5,955 19
Signal service	5,014 42	5,040 58	4,668 93	5,311 54	5,338 76	5,986 12
Steamboat inspection	22,736 59	24,386 95	25,961 36	26,385 88	26,321 27	26,837 83
Hydrographic surveys	16,451 10	17,542 11	31,461 76	12,653 28	15,099 63	12,352 99
Ship channel	6,161 60	5,436 23				
Civil Government	43,195 31	56,477 23	54,988 88	71,373 82		74,801 37
Repairs to wharfs		84 90	1,007 67	824 38	2,644 69	1,795 56
Purchase of Steamer *Minto*						
Winter mail service, P.E.I	3,309 44	4,376 96	6,497 03	6,138 18	7,779 69	21,931 05
Tidal observations	711 59	5,099 17	10,172 61	11,507 24	9,627 45	13,166 20
Gratuities			3,261 32			
Survey, Burrard Inlet	2,580 45					
Export cattle trade	1,411 57	1,711 73	1,350 83	2,268 74	2,887 24	
Survey, Bay of Quinte		2,085 45				
Relief of distressed Canadians				7 30		
Parliamentary returns					291 08	
Invest. effect Chicago drain canal					2,500 00	
John Macdonald					200 00	
Unforeseen expenses						
Marine biological station						
New life-saving station, Long Pt.						
Salaries temporary clerks						
Steamer to replace *Bayfield*						
Observatory, Sulphur Mountain						
Charles Morrison						
Montreal Pilotage Comrs						
" Wireless telegraphy						
Purchase land for wharf at Halifax, N.S						
Purchase land for wharf at Charlottetown, P.E.I						
Schools for navigation						
Naval Militia						
Cattle inspection						
Wrecking plant						
Ice breaking steamers						
S. Shaw						
Salaries, lightkeepers						
Agencies, rents, &c						
Maintenance and repairs						
Repairs to lightships						
Construction and apparatus						
Submarine signal apparatus						
Administration of Pilotage						
Parry Sound Buoy Depot						

from Confederation, June 30, 1906—*Continued.*

1898	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
87,841 22	92,751 23	82,810 92	93,708 16	92,195 52	117,896 37	154,194 26	244,960 38	.....
116,279 88	136,134 79	122,112 42	132,147 88	154,839 06	148,302 34	170,554 10	273,865 74	.....
126,386 00	65,072 35	122,414 86	142,359 01	149,572 14	142,725 69	164,339 92	204,157 27	.....
67,369 98	128,674 15	52,491 93	65,247 80	69,133 51	73,410 65	79,464 50	121,289 44	.....
18,112 93	20,569 81	42 878 40	28,031 85	24,223 73	25,575 33	25,603 09	36,760 32	.....
26,862 03	29,530 20	33,545 95	31,938 25	35,119 03	35,758 43	39,068 34	55,976 59	.....
.....	.....	.....	.....	46 75	.....	.....	.....	.....
6,867 69	3,729 62	7,094 64	12,499 99					
3,649 90	37,838 80	40,319 03	17,060 13					
4,067 99	3,123 16	4,884 22	12,832 69	158,714 09	399,487 73	540,675 07	1,447,202 77	.....
1,423 34	91 49	.....	266 34					
1,409 60	616 96	5,586 91	922 00					
6,414 19	19,305 60	.....	4,160 74					
.....	.....	.....	660 03	.....	.....	.....	93,938 90	.....
.....	.....	.....	.....	.....	.....	.....	10,745 36	.....
117,644 39	145,270 75	180,430 65	195,484 75	452,526 92	369,813 97	306,171 01	476,907 20	587,885 89
.....	.....	.....	.....	.....	.....	6,106 54	3,123 24	.....
3,335 40	3,568 26	3,750 69	3,730 25	3,305 59	4,968 36	7,761 17	5,884 74	7,068 15
27,050 66	.....	.....	.....	.....	.....	178,638 94	236,469 12	132,707 52
312 77	982 17	773 06	1,022 65	1,824 55	1,367 45	3,570 28	5,111 34	7,476 07
.....	.....	.....	.....	.....	.....	.....	12,000 00	.....
38,162 56	37,353 29	37,743 30	36,008 75	51,827 13	48,750 15	50,301 78	51,731 56	50,120 42
64,135 71	73,148 05	76,692 42	74,082 76	80,147 46	87,293 00	90,306 99	98,820 21	99,719 52
818 33	966 48	266 43	546 62	607 23	417 25	1,203 56	1,215 14	1,800 00
704 17	745 49	252 19	1,000 00	1,325 25	682 98	752 60	9,521 68	4,967 15
5,081 40	7,049 09	7,007 97	8,519 92	8,278 55	9,306 25	11,763 12	9,592 91	11,991 43
4,993 88	6,067 90	5,906 83	8,950 17	6,452 56	6,863 75	7,740 01	8,755 44	8,184 39
26,342 29	28,035 49	72,965 72	29,247 59	27,493 80	30,172 09	33,723 12	50,187 75	37,590 22
15,306 66	13,664 97	12,600 98	16,170 20	25,488 64	35,243 97	41,366 95	103,926 98	120,349 69
.....	.....	.....	.....	.....	.....	.....	511,171 41	587,957 51
74,644 05	72,833 97	63,331 61	68,776 95	70,246 32	84,442 53	91,985 07	102,735 31	.....
1,618 97	.....	697 87	1,261 06	2,824 28	1,721 91	1,300 89	1,590 61	2,960 47
.....	144,365 26	41,951 88	.....	.....	.....	.....	.....	.....
9,575 31	8,439 70	1,503 70	2,093 93	8,835 86	6,211 28	8,912 57	10,984 74	16,680 58
3,081 45	5,186 35	4,372 18	7,060 20	8,925 33	14,520 00	21,871 71	23,802 24	28,047 77
.....	.....	.....	.....	136 85	1,050 00	1,210 00	2,340 00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
2,499 80	2,737 85	2,762 24	2,746 84	3,321 23	3,026 25	3,504 43	3,300 35	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	133 32	.....	95 10	.....	269 20	.....
.....	.....	.....	1,659 14	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	3,452 21	2,630 62	3,490 29	4,822 78	3,977 63	2,953 19	3,765 17
.....	5,709 10	739 61	1,990 58	1,998 85	2,000 00	2,996 54	2,001 69	2,914 03
.....	.....	.....	.....	1,780 52	.....	.....	.....	.....
.....	.....	.....	.....	2,967 35	6,945 96	11,448 10	15,881 35	19,947 01
.....	.....	.....	.....	50,000 00	.....	.....	.....	.....
.....	.....	.....	.....	55 00	3,167 62	.....	.....	.....
.....	.....	.....	.....	223 00	.....	.....	.....	.....
.....	.....	.....	.....	3,691 69	.....	.....	.....	.....
.....	.....	.....	.....	.....	1,745 23	2,050 00	10,776 51	.....
.....	.....	.....	.....	.....	3,528 25	18,847 31	40,785 11	88,033 87
.....	.....	.....	.....	.....	.....	15,119 11	.....	.....
.....	.....	.....	.....	.....	.....	13,000 00	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	5,036 29
.....	.....	.....	.....	.....	.....	.....	.....	9,135 87
.....	.....	.....	.....	.....	.....	.....	.....	3,335 52
.....	.....	.....	.....	.....	.....	.....	.....	25,000 00
.....	.....	.....	.....	.....	.....	.....	.....	164,414 93
.....	.....	.....	.....	.....	.....	.....	.....	39 33
.....	.....	.....	.....	.....	.....	.....	.....	242,403 64
.....	.....	.....	.....	.....	.....	.....	.....	29,739 50
.....	.....	.....	.....	.....	.....	.....	.....	531,920 43
.....	.....	.....	.....	.....	.....	.....	.....	23,560 00
.....	.....	.....	.....	.....	.....	.....	.....	1,605,778 59
.....	.....	.....	.....	.....	.....	.....	.....	50,547 60
.....	.....	.....	.....	.....	.....	.....	.....	12,066 42
.....	.....	.....	.....	.....	.....	.....	.....	11,711 17

STATEMENT of Expenditure by the Marine Department

—	1892.	1893.	1894.	1895.	1896.	1897.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Compensation *re* explosion of gas buoys						
Water system, Partridge Island						
Observatory, Toronto						
" Montreal						
Hydrographic str., *Atlantic coast*						
" *Pacific coast*						
New dredge, No. 15						
" *Galveston*						
Shipwrecked and distressed seamen						
Parliamentary returns						
Gratuities						
Civil Government, salaries						
" contingencies						

from Confederation to June 30, 1906—*Concluded.*

1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906
$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
								38,686 49
								2,957 37
								2,872 96
								500 00
								45,500 00
								370 01
								150,001 32
								159,847 89
								598 91
								485 11
								616 66
								88,453 31
								19,506 45
								5,065,252 66

APPENDIX No. 9.

STATEMENT of Revenue of Marine and Fisheries Department for the Fiscal Year ended June 30, 1906.

Service.		Refunds.	Amount.
	$ cts.	$ cts.	$ cts.
Harbours, piers and wharfs			15,493 81
Dominion steamers	24,607 86	1 00	24,606 86
Examinations, masters and mates	5,527 00	1 00	5,526 00
Fines and forfeitures	3,844 00	1,352 51	2,491 49
Steamboat inspection fund			3,592 40
" engineers' certificates			1,012 00
Sick mariners' funds	60,481 82	97 92	60,383 90
Marine registry searches			53 54
Signal station service			2,715 66
Decayed pilotage fund			5,759 51
Pilots Expense account			40 00
Casual revenue sundries	21,289 80	3,489 82	17,799 98
			139,475 15
FISHERIES.			
Ontario			499 15
Quebec	7,576 39	12 00	7,564 39
Nova Scotia	4,939 43	5 00	4,934 43
New Brunswick	11,399 29	3 45	11,395 84
Prince Edward Island			2,206 25
Manitoba	4,160 00	12 00	4,148 00
North-west Territories			864 00
British Columbia	51,582 50	50 00	51,532 50
Yukon			282 00
Alberta			4 97
Hudson Bay			10 00
			83,441 53
Licenses to United States fishing vessels			14,568 16
			98,009 69

RECAPITULATION.

Marine revenue	139,475 15
Fisheries revenue	98,009 69
Total	237,484 84

APPENDIX No. 10.

SICK MARINERS' DUES.

STATEMENT of Sick Mariners' Dues collected for the Fiscal Year ended June 30, 1906.

STATEMENT of Sick Mariners' Dues collected, 1905-6.

Quebec.	$ cts.
Gaspé	271 78
Montreal	6,441 90
Paspebiac	195 04
Percé	113 92
Quebec	7,700 28
Rimouski	354 14
St. Armand	20 06
St. Johns	1,591 86
Sorel	23 38
Three Rivers	269 66
Total	16,982 02
New Brunswick.	
Bathurst	129 08
Campbellton	145 84
Chatham	993 42
Dalhousie	775 36
Moncton	991 60
Newcastle	587 84
Sackville	163 94
St. John	7,764 66
St. Stephen	146 74
	11,698 48
Nova Scotia.	
Amherst	414 12
Annapolis	163 02
Antigonish	5 94
Arichat	25 84
Baddeck	22 20
Barrington	18 28
Canso	208 28
Digby	202 78
Halifax	8,277 64
Kentville	30 12
Liverpool	90 90

Nova Scotia Con.	$ cts.
Lockeport	12 44
Lunenburg	742 88
North Sydney	1,412 34
Parrsboro'	943 14
Pictou	262 38
Port Hawkesbury	126 34
Port Hood	11 94
Shelburne	120 36
Sydney	3,731 06
Truro	1 98
Weymouth	276 46
Windsor	1,567 50
Yarmouth	561 14
Total	19,229 08
British Columbia.	
Nanaimo	4,027 14
New Westminster	51 88
Vancouver	2,189 94
Victoria	5,945 42
Total	12,214 38
Prince Edward Island.	
Charlottetown	264 38
Summerside	93 48
	357 86
Total	60,481 82
Less Refunds	97 92
Grand total	60,383 90

APPENDIX No. 11.

STATEMENT relating to the Wharfs under the control of the Department on June 30, 1906.

Locality.	Wharfinger.	Date of Appointment of Wharfinger	Remuneration allowed.	Amount deposited to credit of Receiver General.
Ontario.				
Barry's Bay	S. Smith	Aug 25, 1905.	25 p.c. of collections.	119 36
Blind River	James Lachore	Sept. 17, 1903.	25 "	559 81
Bronte	J. J. Wilson	Oct. 26, 1905.	25 "	18 10
Bruce Mines	Wm. Fleming	April 15, 1902.	25	129 52
Cockburn Island	G. McKenzie	May 19, 1903.	25 "	24 40
Echo Bay	R. J. Thomas	Nov. 7, 1905.	25 "	27 35
Goderich	W. Marlton	Feb. 14, 1894.	25 "	365 23
Hilton, St. Joseph Id., Algoma	E. Stubbs	June 20, 1898.	50 "	268 46
Honora	Daniel Hay	Oct. 26, 1905.	25 "	19 61
Kingsville	W. H. Black	Aug. 1, 1902.	25 "	382 41
L'Orignal	E. A. Hall	Mar. 23, 1904.	25 "	316 39
Midland	J. Yates	Oct. 26, 1905.	25 "	51 71
Morpeth	C. Stammers	Aug. 1, 1892.	25 "	
North Bay	P. Kinsella	June 30, 1905.	25 "	7 60
Oshawa	W. T. Henry	Aug. 10, 1904.	25 "	2 00
Pelee Island	W. E. Schulthies	June 6, 1906.	25 "	147 21
Pembroke	Thos. Anderson	April 29, 1906.	25 "	49 50
Port Finley	M. McLennan	May 10, 1902.	25 "	
Port Rowan	John Collet	May 2, 1898.	25 "	
Richard's Landing, Algoma	R. Armstrong	Mar. 11, 1899.	50 "	255 88
Rondeau	W. R. Fellows	Dec. 17, 1883.	25 "	50 25
Sault Ste. Marie	Geo. A. Boyd	April 9, 1897.	$142 per month during season of navigation.	1,873 69
Sheguindah	F. G. B. Bradbury	Mar. 10, 1906.	25 p.c. of collections.	152 10
Southampton	Geo. McVittie	Aug. 16, 1895.	25 "	213 21
Summerstown	Under lease			
Thessalon, W. Algoma	D. J. Sandie	April 22, 1902.	25 p.c. of collections.	164 32
Wiarton	Philip Gilbert	Oct. 31, 1902.	25 "	22 50
			Total	5,220 61
Quebec.				
Agnes, Lake Megantic	L. A. Roy	Nov. 27, 1891.	25 p.c. of collections.	
Anse St. Jean	F. Lavoie	Mar. 13, 1 5.	25 "	23 39
Baie St. Paul	Edward Cunningham	Oct. 26, 1905		12 12
Baie St. Paul, Isloated Block	H. Tremblay	Sept. 4, 1894.	25 p.c. of collections.	
Beauport	D. Giroux	Nov. 11, 1896.	25 "	
Berthier	Joseph Blais	Nov. 7, 1905.	25 "	54 18
Cap-à-l'Aigle	Adelard Dufour	May, 11, 1906.	25 "	2 33
Carleton	B. Leclerc	13 June, 1905.	$50 per annum	2 00
Cascades	Moise Leroux	Oct. 20, 1897.	25 p.c. of collections.	
Cedars	J. Reay	April 29, 1898.	25 "	
Chicoutimi	Thomas Tremblay	May 23, 1901.	25 "	47 90
Côteau du Lac	M. St. Amour	Sept. 21, 1896.	50 "	15 32
Côteau Landing	T. Bissionnette	April 30, 1906	25 "	
Echo Vale, Lake Megantic	D. P. Matheson	May 16, 1894	25 "	
Esquimaux Point	Vacant			
Grand River	Geo. Beaudin	Nov. 16, 1896.	25 p.c. of collections.	165 71
Greece's Point	T. Ranger	July 16, 1902		
Isle aux Grues	Désiré Vezina	June 13, 1904	25 p.c. collections.	0 50
Isle Perrot	Roger Leduc	Oct. 20, 1897	25 "	
Knowlton's Landing	L. Knowlton	Nov. 26, 1897	25 "	
Lacolle	R. J. Robinson	Mar. 8, 1894	25 "	13 31
Les Emboulement	W. Bouchard	May 7, 1906	25 "	0 08
L'Islet	J. E. Gamache	May 16, 1906	25 "	
Longueuil	Eusebe Denicourt	May 15 1901.	25 "	22 88
Magog	D. Peters	June 15 1906.	50 "	
Matane	Louis Durette	Aug. 25, 1900.	25 "	282 50
Murray Bay	J. Gagnon	May 16, 1906.	25 "	3 30
New Carlisle	John Chisholm	April 22, 1902.	50 "	34 85
Paspebiac	Olivier Denis	Feb. 16, 1906	25 "	47 52
Percé	E. Bourget	Mar. 11, 1903	25 "	193 84
Port Daniel	Geo. McInnis	April 30, 1903	$50 per annum	106 34

SESSIONAL PAPER No. 21

STATEMENT relating to the Wharfs, &c.—*Continued.*

Locality.	Wharfinger.	Date of Appointment of Wharfinger	Remuneration allowed.	Amount deposited to credit of Receiver General.
Quebec—Con.				
Port Lewis	M. Stalker	April 16, 1906.	25 p.c. of collections.	
Rimouski	Chas. Lepage	July 24, 1894.	25 "	
Riviere Ouelle	J. Hudon dit Beaulieu.	Nov. 28, 1892.	25 "	
Riviere du Loup	L. J. Puize	Nov. 7, 1905.	$146 per annum	68 90
St. Anicet	S. Dupuis	Sept. 14, 1896.	25 p.c. of collections.	
St. Alphonse de Bagotville	Abel Tremblay	July 7, 1891.	25 "	36 22
St. Irénée	Geo. Bouchard	Feb. 10, 1903.	25 "	
St. Jean d'Orleans	L. Lachance.	Sept. 26, 1896.	25 "	102 80
St. Jean Port Joli	J. Pelletier	Sept 14, 1896.	25 "	
Ste. Cécile du Bic	Olivier Ouellette	Aug. 24, 1900.	25 "	66 00
St. Laurent d'Orleans	Joachim Godbout	May 11, 1904.	25 "	55 59
St. Nicholas	Under lease		25 "	25 00
St. Thomas de Montmagny	L. L. Dionne	Oct. 22, 1896.	25 "	20 23
St. Zotique	A. Bissionnette	May 7, 1906.	25 "	7 51
Tadousac	A. Gingras	May 29, 1906.	25 "	10 70
Trois Pistoles	D. Damour	May 10, 1895.	25 "	
Valois Point	L. Castonguay	Oct. 20, 1897.	25 "	
Ville Marie	Jules Maillard	Feb. 2, 1899.	25 "	
			Total	1,421 02
Nova Scotia.				
Arisaig	H. R. McAdam	Dec. 30, 1898.	25 p.c. of collections.	
Avonport	L. F. Fuller	Aug. 15, 1902.	25 "	
Babin's Cove	Alex. Thomas	Oct. 20, 1897.	25 "	3 84
Barrington	J. H. Christie.	Aug. 31, 1896.	25 "	243 25
Bass River	Jotham Fulton	Jan. 6, 1898.	25 "	27 07
Bayfield	Roderick Grant	April 23, 1902.	25 "	
Bear Point	Jacob Small	May 23, 1906.		
Belliveau Cove	St. Clair Therieau	Nov. 24, 1892.	25 p.c. of collections.	100 31
Black Point	J. P. Littlewood	Jan. 8, 1894.	25 "	19 40
Broad Cove	John Teal	June 12, 1893.	25 "	
Broad Cove Marsh	Hugh McDonald	Oct. 19, 1892.	25 "	
Brooklyn	James McLeod	Aug. 3, 1904.		38 67
Brule	Alex. Cracy	Dec. 26, 1898.		0 71
Canada Creek	Henry Dickey	Aug. 12, 1899.	25 p.c. of collections.	6 97
Cape Cove	J. A. Ellis.	May 14, 1897.	25 "	
Centreville	Alfred Ward	May 28, 1897.	25 "	111 25
Chipman's Brook	James Arnold	Nov. 7, 1905.	25 "	
Church Point	Chas. F. Belliveau	Aug. 20, 1892.	25 "	29 55
Cranberry Head	A. Shaw	May 26, 1903.	25 "	
Cribbens Pier, Antigonish Hr.	A. R. Boyd	Oct. 2, 1895.	25 "	
Delap's Cove	R. W. McCaul	Nov. 28, 1889.	25 "	3 67
Descousse (New)	L. N. Poirier	May 31, 1906.	25 "	31 69
Digby	W. W. Hayden	April 20, 1897.	25 "	2,283 87
Eagle Head	Nathan Leslie	Jan. 9, 1899.	25 "	
East Bay	Alex. McGillivray	Aug. 3, 1903.	25 "	
East River, Sheet Harbour	Malcolm McFarlane	May 20, 1890.	25 "	
Grand Narrows, Victoria Co.	F. X. McNeil	Nov. 11, 1896.	25 "	
Grand Narrows, Cape Breton Co.	Neil McNeil	Aug. 6, 1898.	25 "	
Great Village	Vacant			
Granville Centre	Henry Roney	July 6, 1903.	25 p.c. of collections.	49 46
Hall's Harbour	T. A. Neville	Jan. 8, 1897.	25 "	38 74
Hampton	E. B. Foster	May 23, 1904.	25 "	14 42
Hantsport	Vacant			
Harbourville	Isaac Cook	May 28, 1897.	25 p.c. of collections.	13 95
Horton Landing	F. G. Curry	April 30, 1898.	25 "	10 20
Iona, Grand Narrows	F. S. X. McNeil	June 8, 1901.	25 "	
Irish Cove	Malcolm McNeil	June 6, 1902.	25 "	
Isaac's Harbour	T. D. Cook	Jan. 30, 1902.	25 "	2 45
Jordan Bay	John Fredericks	Feb. 20, 1900.	25 "	17 17
Kelly Cove	Jos. B. Huskins.	April 11, 1899.	25 "	
Little Narrows	Vacant			
Lismore	D. A. McKinnon	July 5, 1895.	25 p.c. of collections.	
Maitland, Hants Co.	Vacant			
Margaretsville	C. S. McLean	May 7, 1897.	25 p.c. of collections.	92 02
Meteghan Cove	H. F. Robicheau	" 28, 1897.	25 "	94 21
Meteghan River	D. D'Entremont	" 14, 1897.	25 "	3 08
Militia Point	D. McIntosh	Aug. 20, 1892.	25 "	
Morden	John Redgate	Nov. 16, 1893.	25 "	13 16
Newellton	Arnold Newell	April 23, 1906.	25 "	
Noel	Monson Faulkner	Nov. 7, 1905.	25 "	
Northside Boularderie	Vacant			
Oak Point (Kingsport)	Rent from Railway Company			200 00
Ogilvie	R. S. Armstrong	May 13, 1901.	25 p.c. of collections.	5 10
Parrsboro	Clifford Guilbert			

STATEMENT relating to the Wharfs, &c.—*Continued.*

Locality.	Wharfinger.	Date of Appointment of Wharfinger.	Remuneration allowed.	Amount deposited to credit of Receiver General.
Nova Scotia—Con.				$ cts.
Parsboro'	Clifford Gilbert	June 15, 1906.	25 p.c. of collections	
Parker's Cove	S. Anderson	July 12, 1903.	25 "	80 05
Pickett's Wharf	Freeman A. Eaton	Aug. 2, 1899.	25 "	51 83
Pictou Island	Vacant			
Plymouth	James B. Purdy	Feb. 22, 1902.	25 "	
Plympton	Wm. K. Smith	Aug. 8, 1890.	25 "	
Port Dufferin, Halifax Co.	H. J. Balcom	Feb 17, 1899.	25 "	35 50
Point Brulé	Alex. Craig	Dec. 26, 1898.	25 "	
Port George	Outhit Douglas	June 26, 1900.	25 "	75 94
Port Greville	Vacant			
Port Hood	Albert Macdonald	May 22, 1900.	25 "	
Port Joli	Jos. S. McAdams	Feb. 5, 1900.	25 "	
Port La Tour	C. D. Cook	Aug. 20, 1904.	25 "	26 86
Port Lorne	Freeman Beardsley	June 22, 1897.	25 "	46 37
Port Maitland, Yarmouth Co.	J. Ellis	Dec. 22, 1896.	25 "	13 27
Port Matoun	Geo. Cook	Oct. 28, 1905.	25 "	9 65
Port Morien	John McAuley	Dec. 10, 1896.	7½ "	515 37
Poulomond	B. Boudrot	June 4, 1906.	25 "	42 19
Riverside	Geo. W. Hawes	Mar. 11, 1902.	25 "	
Salmon River, Digby Co.	J. M. Deveau	Nov. 29, 1890.	25 "	
Saulniersville	John T. Saulnier	Aug. 25, 1888.	25 "	34 27
Shag Harbour	R. Nickerson	Oct. 26, 1905.	25 "	19 45
Swims Point	John F. Duncan	Jan. 23, 1902.	25 "	16 31
Tancook Island	Amos H. Stevens	Mar. 11, 1898.	25 "	
Tidnish	R. A. Smith	Sept. 27, 1901.	25 "	
Tiverton	Jno. Sollows	May 23, 1905.	25 "	12 68
Tracadie	J. M. Hall	Nov 6, 1888.	25 "	
Tusket Wedge	Vacant			
Town Point	J. A. Haley	Aug. 16, 1901.		
Victoria	Amos West	Dec. 4, 1900.	25 p.c. of collections	2 14
Wallace	Vacant			
Wallace Harbour, South side				
Washabuck Centre	N. P. McLean	Nov 7, 1905.		
West Pubnico	Chas. C. D'Entremont	Mar. 28, 1898.	25 p.c. of collections	7 60
West River, Sheet Harbour	Malcolm McFarlane	Sept 3, 1889.	25 "	
White Point	Elisha West	Jan. 9, 1889.	25 "	
White Waters	A. C. Kennedy	Feb. 3, 1906.	25 "	3 00
Whycocomagh	D. S. Carmichael	Oct. 31, 1903.		138 70
Wolfville	J. L. Franklin	" 22, 1901.		
			Total	4,579 30
New Brunswick.				
Anderson's Hollow	W. C. Anderson	Feb. 13, 1899.	25 p.c. of collections	174 37
Bathurst	Thomas F. Leahy	Sept. 4, 1903.	25 "	
Black River	J. F. McGourty	Oct. 31, 1902.	25 "	3 19
Buctouche	J. J. Leblanc	May 2, 1892.	25 "	16 35
Burnt Church	James Anderson	Feb. 26, 1904.	25 "	
Campbellton	G. E. Asker	May 11, 1904.	25 "	1,010 55
Cape Tormentine	M. B. Riley	June 25, 1905.	25 "	5 65
Caraquet	Henri Friolet	Sept. 11, 1906.	25 "	
Clifton, Stonehaven	S. Payne	Nov. 9, 1894.	25 "	
Cocagne	H. Bourgeois	Aug. 9, 1900.	25 "	2 10
Cole's Point, Dorchester	Edward Cole	" 29, 1903.	25 "	15 00
Dalhousie	W. J. Smith	June 27, 1891.	25 p.c. of collections	123 61
Edgett's Landing	Thos. Barnett	July 5, 1895.	25 "	15 77
Gardner's Creek	Robert Wallace	Dec. 11, 1899.	25 "	
Hopewell Cape	Geo. D. Wilson	April 10, 1899.	25 "	57 92
Kingston	P. Thibodeau	Jan. 31, 1901.	25 "	
Main River, Richibucto	A. S. Murray	June 20, 1906.	25 "	
Neguac	James Martin	Jan. 19, 1905.	25 "	
Quaco	Wellington Vale	Dec. 19, 1899.	25 "	2 75
St. Louis	C. Frigand	Oct. 29, 1895.	25 "	
St. Mary's	M. J. S. Leblanc	Mar. 1, 1897.	25 "	
St. Nicholas River, S. Welford	John Grant	Sept. 27, 1904.	25 "	
Tracadie	Prosper Savoy	" 23, 1889.	25 "	14 26
Two Rivers	Wesley Wilbur	Jan. 8, 1894.	25 "	
			Total	2,001 86

SESSIONAL PAPER No. 21

STATEMENT relating to the Wharfs, &c.—*Concluded.*

Locality.	Wharfinger.	Date of Appointment of Wharfinger.	Remuneration allowed.	Amount deposited to credit of Receiver General.
Prince Edward Island.				
Annandale	W. C. Jenkins	May 4, 1897.	25 p.c. of collections	69 90
Bay View	Joseph Harrington	Oct. 2, 1885.	25 "	4 32
Belfast	Jas. F. Halliday	May 1, 1901.	25 "	94 08
Brush Wharf	J. T. Morrisey	June 6, 1906.	25 "	19 20
Campbell's Cove	Angus McIntyre	Oct. 17, 1888.	25 "	
Chapel Point	Roland McCormack	Sept. 18, 1885.	25 "	13 97
Charlottetown	A. Lord, Agt. Marine and Fisheries	.....	.....	592 87
China Point	W. S. N. Crane	" 18, 1885.	25 "	13 50
Clifton	John Gunn	May 24, 1900.	25 "	
Cranberry, East River	James Hughes	Mar. 1, 1898.	25 "	
Crapaud, Victoria Pier	E. McKinnon	July 7, 1897.	25 "	288 36
Georgetown	R. R. Jenkins	Oct. 14, 1892.	25 p.c. of collections	14 23
Haggerty's Wharf, E. River	M. Burnett	Feb. 14, 1898.	25 "	9 60
Hickey's Wharf	Mark Webster	Oct. 22, 1896.	25 "	27 90
Higgin's Shore	G. G. Henry	Nov. 9, 1891.	25 "	
Hurd's Point	Thos. Montgomery	Aug. 16, 1901.	25 "	48 41
Kier's Shore	W. Hodgson	June 10, 1895.	25 "	137 68
Lambert and Stevens (Montague)	Wellington Johnston	May 3, 1900.	25 "	24 27
Lewis Point	J. G. Scrimigeour	Oct. 14, 1896.	25 "	
McGee's Wharf, Abram's Vill.	Norman Gallant	Nov. 9, 1901.	25 "	
Mink River or Murray Harbour, North	James P. Clow	Aug. 25, 1900.	25 "	23 47
Murray Harbour, North	.....	.....	.....	
Murray Harbour, South	J. McKinnon	Jan. 27, 1896.	25 "	
Nine Mile Creek	C. McDonald	May 21, 1906.	25 "	
North Cardigan	Rodk J. Steele	May 1, 1901.	25 "	72 15
Pinette	Malcolm McLeod	Jan. 3, 1901.	25 "	4 18
Pownal	M. M. Haley	Oct. 13, 1896.	25 "	25 76
Red Point	Arch. Smith	April 3, 1900.	25 "	16 55
St. Mary's Bay	John Dickson	Dec. 10, 1896.	25 "	26 80
Souris	Angus McDonald, caretaker	Sept. 27, 1894.	25 "	
South Rustico, Oyster Bed Bridge	D. Gallant	Feb. 23, 1895.	25 "	1 80
Sturgeon River	Bernard Kearney	Sept. 18, 1885.	25 "	27 45
Tignish	A. J. Gaudet	Aug. 23, 1898.	25 "	1 61
Vernon River	W. M. Forbes	April 22, 1902.	25 "	95 32
Wood Island	James Young	" 10, 1899.	25 "	10 89
			Total	1,664 27

RECAPITULATION.

Ontario		$ 5,220 61
Quebec		1,421 02
Nova Scotia		4,579 30
New Brunswick		2,001 86
Prince Edward Island		1,664 27
Total wharfage dues placed to credit of Receiver General		$ 14,887 06
Add—Fees received by undermentioned harbour masters in excess of remuneration allowed:—		
Harbour Master—Port Arthur, Ont	$ 62 00	
" St. John, Que	210 50	
" Sorel, Que	191 00	
" Canso, N.S	3 50	
" International Pier, N.S	62 00	
" Louisburg, N.S	12 25	
" Lunenburg	3 50	
" Comox	42 00	
" Ladysmith	20 00	
	$	606 75
Total Revenue from Wharfs and Harbours		$ 15,493 81

STEAMBOAT INSPECTION DUES.

STATEMENT of Steamboat Inspection Dues collected during the Fiscal Year ending June 30, 1906.

	$ cts.		
Ontario.		*Nova Scotia.*	
Sault Ste. Marie	45 68	Halifax	1,150 72
Windsor	138 40	Kentville	532 24
	184 08	North Sydney	92 40
			1,775 36
Quebec.		*British Columbia.*	
Quebec	80 72	Vancouver	271 76
		Victoria	155 44
			427 20
New Brunswick.		*North-west Territories.*	
St. Stephen	60 00	Dawson	1,065 04
		Total	3,592 40
		Fees for engineers' certificates	1,012 00
		Grand total	4,604 40

MARINE AND FISHERIES, CANADA.

REPORT

ON THE

RIVER ST. LAWRENCE SHIP CHANNEL

FROM

MONTREAL TO QUEBEC AND FATHER POINT.

F. W. COWIE, B.A. Sc., M. Can. Soc. C.E.,
Superintending Engineer.

MARINE AND FISHERIES, CANADA.

River St. Lawrence Ship Channel.

Ottawa, Ont., December 15, 1906.

Sir,—According to your instructions, I beg to present the following annual report on the operations for the improvement of the River St. Lawrence Ship Channel during the fiscal year ended June 30, 1906.

As usual, although the dredging reports and the cost and details of the work are made for the fiscal year, the general information, which is of great importance to the navigation interests, is completed to the date of writing, or the close of the season of navigation.

The announcement of the completion of the 30 foot channel between Montreal and Batiscan, which, by taking advantage of the tides to Quebec, gives a depth for navigation between Montreal and Quebec of 30 feet at extreme low water, cannot fail to be of great satisfaction to those interested in the St. Lawrence route.

It is with very much pleasure that I acknowledge the great measure to which the success of the operations is due to the untiring and loyal work of the staff of engineers and crews of the various vessels engaged on the work.

I have the honour to be, sir,

Yours obediently,

F. W. COWIE,
Superintending Engineer.

Lieutenant-Colonel F. Gourdeau,
Deputy Minister of Marine and Fisheries,
Ottawa, Ont.

APPENDIX No. 12.

RIVER ST. LAWRENCE SHIP CHANNEL.

INTRODUCTION.

The ship channel of the River St. Lawrence, between Montreal and Father Point, has a total length of about 340 statute miles.

Navigation throughout this distance is under the control of the Montreal and Quebec pilots.

The contracted part of the river, which may properly be called ship channel, commences at the Traverse, to which point, from Montreal, the distance is 220 miles.

The length of channel actually requiring improvement by dredging from Montreal to the Traverse, is about 70 miles. The length of the 30 foot channel actually completed, at the date of writing, the close of navigation, 1906, is 56 miles; leaving 14 miles yet remaining to be dredged, in order to give a clear depth of 30 feet at low tides during the lowest stage of the river level.

From Montreal to Batiscan the tide is not available for navigation, and in order to enable vessels to load to full depth, the dredging of this part of the river was first undertaken.

At the close of the season of 1906 we are able to announce the completion of the channel to a depth of 30 feet at the extreme low water of 1897, between the points above mentioned, viz.:—Montreal and Batiscan. As the E.L.W. of 1897 was six inches lower than the level reached last season, the minimum depth found in the 30 foot channel, in 1906, was 30 feet 6 inches.

The completed channel has a minimum width, in the straight portions, of 450 feet, and on the curves from 500 to 750 feet. The widening has all been completed, except for a distance of 12.30 miles in the straight portions of Lake St. Peter.

As the dredging is completed the channel is swept and, therefore, with the above announcement, an available depth of 30 feet exists from the sea to Montreal, advantage to be taken of the tide up to Batiscan.

The whole of the dredging plant will now be concentrated on the work of obtaining a greater width in Lake St. Peter and the tidal parts of the river, as well as the full depth of 30 feet at low tide. About an equal quantity of work requires to be done below Quebec and above Quebec.

In 1905 the commencement of construction was made of a large steel, sea-going, hydraulic hopper dredge, for the work below Quebec. The dredge is being built at Sorel. It was launched on December 1, 1906, and it is expected will be ready for work, as already stated, early in the season of 1907.

As the tonnage and size of vessels has made such rapid increases, it was decided that it would be unwise to wait so long, before the commencement of improvements below Quebec. Owing to the exposed locality, the strong and changeable currents, and the great rise and fall of the tides, the ordinary type of dredge in this country is not suitable for this work. The English or European sea-going dredge being the type required.

Inquiries were made in England for a suitable dredge, for immediate delivery. Messrs. H. E. Moss & Company, of Liverpool, England, offered a sea-going, suction, hopper dredge, built in 1904, at a very reasonable figure. After inspection, the purchase of this dredge was concluded, and she was brought from New Orleans to the St.

Lawrence in June, 1906. After being overhauled and damage to the hopper gates repaired, this dredge was taken down below Quebec and put to work on the Beaujeu Bank, and before the close of the season removed about 100,000 cubic yards of sand and soft clay.

The season just closed has also marked the construction in England and the bringing to the St. Lawrence of a powerful and well-equipped ice-breaking, surveying and sweeping tug.

It is probable that no other action on the part of the government, in the way of making navigation safer, could contribute more to improvement in the excessive insurance rates which have been so detrimental to the St. Lawrence route.

On her first trip after being put into commission, while on an inspection and consultation trip with the Minister, the Officers of the Department, the Shipping Federation of Canada, the Presidents of the Boards of Trade of Montreal and Quebec on board, this vessel relieved from a very dangerous position at Cap à la Roche a steamer, which, with its large cargo, was estimated to have a value of $1,000,000.

By its timely aid the vessel was floated before any serious damage had been done to the ship's bottom, and the Donaldson Liner *Athenia* was able to proceed on her voyage to Glasgow without more delay than a few hours, and apparently without injury.

Although the water in the St. Lawrence reached a stage considerably lower than usual, the season just closed was marked by an almost complete freedom from serious accidents.

It is probable that between Montreal and Quebec, during the season of 1906, the total losses, including salvage assistance, would not amount to much more than the very insignificant sum of $1,000. Surely nothing could be a greater indication of the safety of the Ship Channel and the skilfulness and care of the pilots than such a record, in a length of channel of 160 miles, navigated up and down by nearly a thousand ocean-going steamers.

The Shipping Federation of Canada and the Montreal Board of Trade having petitioned the Minister, urging the utmost vigour in the prosecution of the work, the construction of an additional dredge for Cap à la Roche has been commenced. This dredge has been carefully designed, with sufficient power to attack the banks at Cap à la Roche and Cap Charles, where the material is soft shale rock, and where the widening is urgently required.

The members of the Shipping Federation of Canada, and the Presidents of the Boards of Trade of Montreal and Quebec, accompanied the Minister and Officials of the Department, during the month of November, 1906, on the annual inspection of the Ship Channel, between Montreal and Crane Island.

Three days were occupied in observing the work, discussing the merits of the proposed plans, and considering the various recommendations.

Resolutions of approval of the Departmental programme have been received, together with the thanks of these important Corporations, for having been afforded an opportunity of actually observing the conditions, and placing their recommendations before the Department.

At the close of the season of navigation the dredge *Galveston,* instead of being laid up at Sorel, was sent to St. John, N.B., in order to do some urgent work required during the present winter, to enable the large vessels to use the Intercolonial berths.

The season just closed has been a very arduous one, and in view of the success of the work, and the record of navigation, too much recognition of their services cannot be given to the Officers of the Staff, especially Mr. G. J. Desbarats, Director of the Shipyard at Sorel, who has the direction of the construction and repairs to the plant; Mr. V. W. Forneret, C.E., who has general local charge of the dredges, and Mr. N. B. McLean, C.E., who conducted the sweeping operations, together with the other members of the Staff, as well as the Captains and Engineers of the Dredging Plant.

PHYSICAL FEATURES.

It is probable that there is no river in the world better adopted for improvement than the St. Lawrence.

The Great Lakes act as storage reservoirs and settling basins.

Except for floods during the ice accumulations, the fluctuations in level are gradual and not excessive.

The position of the St. Lawrence is the reverse of most rivers. The usual condition of a river is, from the source, steep slopes which erode the banks and transport coarse material, which, as the slope becomes more gradual, decreases until at the mouth of the river the water carries in suspension a fine sediment which deposits, to the great detriment of navigation.

In the St. Lawrence the material from most of the sources of supply is all deposited in the settling basins. From the lakes to the ocean the bottom of the river is usually hard, so that we have not only clear water, but a permanent river bed.

The nature of the material composing the bottom of the river, though in many places very difficult to dredge, is for the same reason of such a character that a dredged cut once made is substantially permanent.

In the ship channel the material to be excavated varies from soft blue clay into which a pole may be planted some 6 or 7 feet by hand, to stiff clay, to hard pan as hard as a macadamized road, to shale rock and large boulders. In one or two localities we find coarse sand, at which points dredging has to some extent to be repeated.

Below Quebec, at the localities where the fresh and salt waters meet, there are the usual sand bars. The best information goes to show that these shoals are not increasing. As the size and draught of ships increase, as well as the competition in speed, detention while waiting for the tide to pass these bars is more apparent; and it is urgent that a clear depth of 30 feet at low tide be obtained as soon as possible.

The movable nature of the material, added to the lack of uniformity of the tides, currents and salt water, results in more unstability in the shoals below Quebec. It is therefore expected that the maintenance of the excavated channels, there, will require some annual re-dredging.

The currents of the St. Lawrence are, for a river of such a size, not only reasonable and regular, but altogether free from the usual dangers to navigation resulting from freshets.

The winter season, with its ice and snow, is the one great drawback to the St. Lawrence. This route, however, with its 7 months season of navigation, is one of the greatest factors in the success of the Canadian transportation system.

KEEPING PACE WITH THE SHIPPING.

The St. Lawrence, owing to its situation, is the natural gateway from the Atlantic to at least one-third of the continent of North America.

In 1844 it was in an effort to give navigation to Montreal for vessels of 500 tons that the first work of dredging was undertaken.

The work is still considered one of the great river improvement works in the world. The plant is up-to-date. In many respects it leads, in design and economy. The organization, staff and dredge officers are a result of the training of some of the most skilled engineers of the times.

The early surveys and designs were made under the direction of English and Scotch engineers, and the first dredge machinery was built in Glasgow.

Since 1874, however, all the engineers and superintendents, and probably all the men, have been Canadians, and the dredges designed and built in Canada.

The aim is to give a safe and ample waterway for ships suitable for the commercial requirements of the trade and route.

The channel does not afford the usual difficulties of canal navigation. There is sufficient water on the banks to minimize induced currents which, when the cross section of the ship is large in proportion to the cross section of the channel, makes safe steering at ordinary speed difficult.

The ratio between the cross section of the Suez Canal, at its section of minimum dimensions, to a ship of the size of the Canadian Pacific Railway 'Empresses,' is about 3 to 1.

The cross section of the 8-mile Culebra cut of the proposed Panama Canal is, in the most liberal proposition, only 8,000 square feet, and it is very probable that the canal will be opened for traffic with the channel having a cross section very much less than that, and intended for the largest ships afloat.

The River St. Lawrence at Cap à la Roche, the narrowest point, will have a minimum cross section, when the 30 foot channel is completed, of about 80,000 square feet in the length of 3 miles of rock cutting.

The Ship Channel has, therefore, many advantages over most other artificial water routes, not only as to tonnage capacity, but for safe steering at a reasonable speed. The *Victorian* and *Virginian,* the largest ships reaching Montreal, have frequently made the voyage to Quebec in less than 10 hours, without trouble.

In canals it is a well known rule that when the speed of a large ship becomes too great, the currents induced by the passage of the vessel result in forces acting on the bow which increase the more the vessel is out of the centre of the canal, so that all the power of the rudder and twin-screws will not bring the ship back. This is what is called 'taking a sheer,' and it explains the apparent paradox in the steering of vessels in contracted canals, because usually a ship obeys her helm more readily when the engines are at full speed, owing to the increased action of the water from the screws on the rudder.

For vessels of large size, in the narrow cuts, during low water, we urge that a moderate speed, sufficient to keep a ship under full control, is a matter of the greatest safety.

The Suez Canal has a length of about 100 miles. Its width, at the bottom, is at many places only 118 feet and, at the top, from 190 to 330 feet, yet it is regularly used by P. & O. liners with a length of 500 feet, a breadth of 54 feet and a draught of over 27 feet. At certain stages of the tide they also have a current of $2\frac{1}{2}$ knots.

Although the Suez Canal has magnificent financial resources, it is not being enlarged with anything like the rapidity of the River St. Lawrence Ship Channel.

In the last 10 years the general size and tonnage of vessels have increased quite 100 per cent. It is expected that the 10 years commencing in 1900 will see the Ship Channel enlarged, from a minimum width of 300 feet and a depth of 26 feet 2 inches, to a minimum width of 450 feet, with a depth of 30 feet, which is no more than keeping pace with the shipping.

HISTORY OF THE WORK.

The agitation for the deepening of the channel in Lake St. Peter, so as to permit all ocean vessels to come up the St. Lawrence to Montreal, commenced about the year 1825.

The actual work of dredging commenced in 1844, the machinery of the first dredge having been brought from the Old Country.

The dredging was commenced as a Public Work. The location of the first channel, however, did not give satisfaction, and the work was stopped.

The Montreal merchants finally concluded that they could conduct the work more satisfactorily and pay the interest on the cost by a tax on the shipping.

Legislation was passed in 1850, transferring the plant to the Montreal Harbour Commissioners and authorizing them to proceed with the work as they should deem best.

The rate of interest paid on the coast, of the early improvements, by the Commissioners, was 8 per cent.

The minimum depth in Lake St. Peter was about 11 feet, during low water, and at first only the deepening of the lake mud flats was contemplated.

The Harbour Commissioners conducted all operations from 1851 to 1888, the improvement being found to be required at many points, extending between Montreal and Cap Charles.

A dredge in 1846 excavated in Lake St. Peter, in one day, about 1,200 cubic yards. By wonderful improvements to plant, in 1888 a dredge would excavate 7,200 cubic yards without trouble, and in 1906, working day and night, 20,000 yards was a frequent day's work.

In 1888 the channel was completed from Montreal to Cap à la Roche to 27½ feet at ordinary low water (26 feet 2 inches at the new datum, or extreme low water of 1897, which has been adopted for the 30-foot channel). From Cap à la Roche to Quebec heavy draught vessels would pass with the tide.

In 1889, in order to relieve the shipping of the heavy tonnage tax, the Government adopted the channel as a National route. The debt was assumed and the tax abolished, and the Department of Public Works continued the work.

In 1904, with a view to systematizing navigation matters, the management and control of the River St. Lawrence Ship Channel, together with the plant and Sorel Shipyard, were transferred to the Department of Marine and Fisheries.

Although on several occasions, especially in 1879, the water fell considerably below the ordinary stage of 10½ feet on the Flats of Lake St. Peter, the extraordinary low stage of 1895, and again in 1897, and the increase in the size of ships, made it urgent that the channel should be further enlarged.

In 1897 new and powerful dredging plant was commenced, with a view to further extensive improvements.

THE PROJECT OF 1899.

In 1899 the project of the 30-foot channel was adopted.

Two new dredges, with tugs, scows and barges, had been put in commission. Two more dredges were nearly completed, and two others authorized.

The low water of 1897, the lowest on record to the present date, except for a few days of abnormal low water in 1895, was adopted and it was decided to make the depth 30 feet from that low level.

The average depth in the 30-foot channel, as being dredged, was, during the season of 1906, as follows: May, 36 feet; June, 35 feet 1 inch; July, 32 feet 11 inches; August, 31 feet 7 inches; September, 30 feet 11 inches; October, 31 feet; November, 31 feet 2 inches.

The greatest depth from May to November was 36 feet 11 inches, and the least, during the month of October, 30 feet 6 inches.

Besides the increased depth, it was decided to widen the channel at least 50 per cent. The curves were to be made as flat as possible and to a width of from 500 to 750 feet. By the radical method of dredging 450 feet was about the limit for one cut, and that width on the tangents was adopted. This compares very favourably with any navigation route in the world, where the courses may be easily marked by range lights.

Between Montreal and Quebec, a distance of 160 miles, there are 62 distinct courses, or over 2½ miles each, of which already 47 are marked by range lights.

The 30-foot project was adopted in 1899; in that year with 2 new dredges, in 1900 with 4, in 1901 with 5 and from 1902 with 7 dredges, the work has been carried on with great vigour.

The completion of nearly 40,000,000 cubic yards of excavation in 10 years was the best estimate given. It is expected that this will be realized, and at the exceedingly low cost, including plant, of less than $5,000,000.

The total cost from 1851 to the end of the fiscal year, of the Ship Channel, plant, shops, &c., is as follows:—

Dredging	$5,929,970 44
Plant, shops, surveys, &c	3,031,860 37
	$8,961,830 81

Before the close of navigation, in November, 1906, the 30-foot depth was completed from Montreal to Batiscan, from which point to the sea the same depth, or more, can be carried, by waiting for the tide.

Only 7.10 miles of dredging remains to be completed and although the most difficult is yet to be done, there is no anxiety but that with the magnificent plant, it will be completed well within the time expected.

With the present project completed and well marked, it is expected that an additional depth of 4 feet over the same width could be obtained in a much shorter time.

NAVIGATION CONDITIONS.

The water in the St. Lawrence, like all North Atlantic rivers, owing to the lack of rain fall, reached a very low stage during the last four months of the season of 1906.

The dredging operations do not either theoretically or practically lower the level of the water in the river. No material is removed; it is merely taken from one place and deposited opposite. As long as the water supply remains the same we can rely on the same river level.

The interests of the Harbour of Montreal and the navigation of the St. Lawrence must, however, be jealously guarded against any interference with the natural conditions, which will in the least degree diminish the natural flow, during the season of low water.

The 27½-foot depth at ordinary low water, as found in the uncompleted parts of the 30-foot Ship Channel, between Montreal and Batiscan, still governed during the past season the depth for navigation.

On October 28 a report was made, stating that as the only link between those points, then not finished to 30 feet, had been examined, an additional draught could be carried, or vessels could safely load to the full depth given by the Sorel gauge.

The average depth in the Ship Channel, available for navigation, with the greatest and least depths in each year, from May to November, since 1890, is given in the following table:—

Year.	Average Depth for each Month.							From Sorel Gauge during each year, May to November.	
	May.	June.	July	August.	Sept.	Oct.	Nov.	Highest.	Lowest.
	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.
1890	37 6	35 3	31 9	30 6	30 9	29 9	30 6	37 0	29 0
1891	34 6	31 3	29 9	29 9	30 0	28 3	28 3	36 9	27 3
1892	31 0	31 9	31 6	30 6	28 9	28 3	28 3	33 6	27 3
1893	36 0	34 3	30 9	29 9	29 6	28 6	28 0	37 6	27 6
1894	34 6	31 9	31 0	29 2	28 3	28 9	29 0	36 0	27 7
1895	33 3	31 3	28 3	28 3	27 6	26 9	26 9	34 6	25 10
1896	33 6	30 6	28 9	28 0	27 6	27 9	29 0	37 0	27 4
1897	35 6	32 6	30 3	29 3	28 0	27 0	27 6	37 0	26 5
1898	31 6	30 9	29 8	28 6	28 2	28 3	28 6	32 1	26 9
1899	36 2	31 9	30 3	28 6	27 6	28 9	27 9	37 9	26 9
1900	33 6	30 9	30 6	29 6	28 1	28 9	29 2	35 9	27 4
1901	34 3	31 10	29 2	28 3	27 7	27 4	27 3	36 3	26 6
1902	32 2	32 2	32 2	29 4	28 1	28 1	29 0	34 1	27 6
1903	33 0	30 11	30 5	29 5	28 4	29 0	27 11	32 8	26 11
1904	36 3	34 5	30 9	29 5	29 5	30 4	29 3	37 4	28 1
1905	31 10	30 8	29 7	29 6	28 6	28 5	28 1	33 6	27 1
1906	32 4	31 5	29 3	27 11	27 3	27 4	27 6	33 3	26 9

On the opening of the season of navigation of 1907 the gauge at Sorel will be changed and an additional draught of nearly 4 feet given.

Compared with the lowest stage of water in 1906, the depth will be increased from 26 feet 10 inches to 30 feet 6 inches.

This cannot fail to be of very great importance to the commercial interests of the St. Lawrence, and it is understood that the navigation plans for next year promise a great increase in the size and tonnage of vessels to Montreal.

ACCIDENTS IN 1906.

As the season of 1905 was memorable on account of the number and seriousness of the accidents in the St. Lawrence, that of 1906 was a record one for safety and the exceedingly slight damage and loss.

In the Harbour of Montreal there were two collisions, at almost the same place, near the end of Victoria pier. As a result of the first one the ss. *Gaspesien,* a small coasting vessel, was grounded as a precaution.

Between Montreal and Quebec the season passed with a record of only three slight accidents.

The *Nyassa,* at Contrecœur, on July 29, went on a soft mud bank, owing to the failure of the steering gear. After lightering a very small quantity of cargo, she was pulled off and proceeded without damage.

The *Monmouth* and *Agnar* crowded into the Cap Charles cut together, and the *Agnar* went on the bank, floating again in a few minutes, without damage.

The new 10,000-ton ss. *Athenia,* with a valuable cargo, ran into a snow storm at Cap à la Roche, on November 9, and went aground on the north bank. This is one of the worst places in the river, and great fears were entertained for her safety. Fortunately the C.G.S. *Lady Grey* arrived, and with her aid, assisted by dredge tugs, the steamship was floated with the rising tide, and proceeded without apparent damage.

The damage and cost of the floating of these vessels could not have amounted to the loss sustained on a railway by the smashing of a couple of freight cars, and yet the traffic in freight and passengers, on the route, amounted to what would be a very extensive amount of railway business.

Between Quebec and Father Point the coasting ss. *Campana* went ashore in a fog. The large coal ship *Mystic* grounded at Crane Island, and the coaster *Polino* went badly aground in a snow storm on Goose Island.

This is a splendid record for such a long stretch of river and extensive traffic.

Below the Pilotage District, in the St. Lawrence to the Gulf, the ss. *Bray head* was reported to have grounded while loading. The ss. *Cervona* was stranded for a few days on Anticosti, and the Dominion liner *Kensington* went aground near Matane, but after a trying experience in an autumn storm, she safely floated and proceeded to Montreal.

For the River and Gulf of St. Lawrence, from Montreal to Cape Ray, a distance of 700 nautical miles, the above statement of accidents for 1906 is, to say the least, exceedingly satisfactory.

GENERAL INFORMATION.

Although, with the exception of some minor shoals at Champlain, there is practically no filling in, and although since its commencement no actual boulders have been known to have been carried into the dredged channel, as such conditions are possible, it has been decided that once a year the dredged and shallow channels shall be swept.

This is a large problem. The work has to be done with very great care, and good weather conditions are required.

Mr. N. B. McLean, C.E., with an assistant, were specially detailed for this important work. A twin-screw river steamer and a testing scow make up the present sweeping plant. When the channel was 300 feet wide and only 60 miles required sweeping, this plant was sufficient. The work below Batiscan, including Cap à la Roche, where the weather is bad and the current strong, was then left until mid-summer.

The Shipping Federation of Canada, the Pilots and Boards of Trade, have urged for more sweeping, both above and below Quebec, and a regular examination early each Spring, when the weather, strong current and depth of water make the present plant of no use.

The new-ice breaking and sweeping tug 'Lady Grey' has been carefully designed, with a view to this service.

Two semaphores, indicating the channel depths in their respective localities, were maintained as usual, the one at St. Jean des Chaillons for the depth in the Cap à la Roche dredged cut, and the other at St. Nicholas for the depth over the undredged St. Augustin Bar.

The Department has been engaged in studying a plan for signal stations between Montreal and Quebec, for the safety and regulation of traffic, more on the lines of a canal or railway organization.

Experience has shown how imperative it is for vessels, especially the large ones, navigating the St. Lawrence between Montreal and Quebec, to have knowledge of the conditions in the narrow reaches of the channel ahead. Fog, thick mist, or smoke from bush fires, frequently settle down very suddenly and render it very unsafe to proceed.

To cite a particular instance, it is claimed that if the semaphore operator at Cap à la Roche could have reported fog, the R.M.S. 'Victorian' would have anchored at Batiscan on Septmber 1, 1905, where the weather was perfectly clear at the time, and thus prevented the accident at Cap Charles.

The valuable features of the service would therefore be the reporting of weather conditions along the route, depth of water in the tidal sections of the River, positions of vessels and, especially, casualties or obstructions in the Ship Channel. The value of the Government long distance service would be very great, particularly with regard to dredging operations, buoy service and general Government business.

It is hoped that early in 1907 a system of stations, connected by a private copper telephone wire operated by the Bell Telephone Company, will be completed.

From the latest information the number of sea-going vessels reaching Montreal, in 1906, was 820, and the total ocean-going tonnage for the season reached 1,977,534 tons, an increase of 2 per cent.

DIVISIONS.

Ship Channel between Montreal and Quebec.

Division I., Montreal to Sorel.

The Eastern limit of the Harbour of Montreal is Longue Pointe. An extensive shoal of clay, boulders and hard pan, exists opposite Longueuil. Although the dredging of the Ship Channel at this place was not included in the project of 1899, it was necessary, before the 30-foot channel would be available to Montreal, and could not be delayed.

The Montreal Harbour Commissioners had not suitable plant, so at the urgent request of the Shipping Federation of Canada the Department undertook this work which, owing to its situation at the foot of the St. Mary's current and the hard nature of the material, was an addition of considerable importance to the project.

The work was commenced in August, 1905, and all completed by two dredges and a stone-lifter, in August, 1906.

This completes the 30-foot channel in this Division which, in a distance of 45 miles, required 22·9 miles of dredging.

With the exception of the range lights in Montreal Harbour, and two nearly completed near Sorel, the improvements in this Division are all completed.

Division II., Sorel to Batiscan.

Although there is a tide between Three Rivers and Batiscan, it is not available for navigation, being too uncertain both as to height and time.

The dredging for the 30-foot channel is practically completed. A few days' work at the head of Lake St. Peter and a similar amount at Batture Perron, widening the natural channel, will finish the improvements.

The permanent range lights are also all either completed or well under way.

In this Division, in a distance of 35 miles, the length requiring dredging was 12.45 miles.

Division III., Lake St. Peter.

The St. Lawrence at Lake St. Peter widens out into a shallow water lake, about 9 miles wide and 22 miles long. The material is almost all soft blue clay of the consistency of ordinary table butter. A bank made almost vertical will remain for years. There is practically no filling in, but the wash of the propellers deepens the centre of the channel slightly and deposits it near the South bank.

At the close of navigation, 1906, the deepening to 30 feet at low water was completed. All of the three important curves have been widened to from 600 to 650 feet.

The length requiring dredging was 18 miles. This work is being left entirely to the hydraulic dredge 'J. Israel Tarte.' All of the deepening being now completed, this dredge will undertake next year widening and the construction of an anchorage in the middle of the Lake.

The permanent piers built by the lighthouse branch, are also completed and are giving very great satisfaction.

The deepening of the present channel was continued, leaving the widening, at the request of the navigation interests and the pilots, it being well known that in these long straight reaches, with very little current, navigation with the largest ships is quite safe, if the depth is available.

Division IV., Batiscan to Quebec.

From Batiscan to Quebec, a distance of about 60 miles, improvements require to be made over a length of about 10 miles, 2.90 miles of which is already completed to the 30-foot depth.

In this Division there are about 4 miles of work to be done, at Cap à la Roche and Cap Charles, mostly in solid shale rock.

This is one of the most important and difficult sections of the ship channel. The channel plant is particularly well adapted for this work, the only question being the fact that even with the six elevator dredges the work will not be completed, as was expected, before the arrival of the 15,000 ton ships.

In consideration of the fairly soft character of the shale rock, of the strong current, and of the fact that the work must be carried on without interrupting navigation, the elevator dredge is by far the most economical and efficient machine known. A powerful spoon dredge may tear up a certain quantity of soft rock more quickly, without stopping to make a clean, even bottom, chisel cutters and blasting plants may break up harder material, but taking everything into consideration the type of plant in the possession of the Department is particularly well designed for good, clean work, without interrupting navigation.

The shipping interests are urging for the early completion of this work, and another dredge is being constructed especially to rush the widening of the shale banks.

The distance between Batiscan and Quebec is about 60 miles. Tidal navigation is available throughout the whole distance.

At Cap à la Roche a semaphore, which is visible from Batiscan to Grondines, shows the depth in the channel opposite that place. Vessels of deep draught either anchor and wait for the tide, or time their trip so as to pass at or near high water.

The channel at Barre à Boulard, in the Richelieu rapids, and at Cap Santé, is completed to 30 feet at low tide, so that practically the only delay is two hours out of twelve at St. Nicholas, and for half tide at Cap à la Roche.

The dredging at Cap à la Roche stopped in 1893; it was recommenced in July, 1906. The material is shale of about the hardness of a soft school slate. There is no great difficulty in dredging it, the real difficulties to contend with being the holding of the dredges, the strong current and the heavy sea, during an easterly gale.

Dredge No. 5 (*Lafontaine*), commenced in July and stopped in November. In 113 days this dredge removed 159,000 cubic yards of shale from a depth of from 31 to 40 feet.

The improvements for the 30-foot channel have been designed with all possible care, so as to make a safe and easily navigable channel and at the same time be easily marked, and to offer a minimum of trouble to navigation during construction.

Instead of two curves, one curve of 3 miles radius has been laid out, in short tangents to be easily marked by buoys, and having a width varying from 500 to 550 feet.

In 1907, with four elevator dredges at work and one spoon dredge, if completed in time, it is expected that very closely to one million yards of this rock will be excavated.

SHIP CHANNEL BELOW QUEBEC.

Division V, Quebec to The Traverse.

The Parliamentary appropriation, to enable the commencement of the work of improving the channel below Quebec, became available late in the autumn of 1905.

It was decided to construct at the Government Shipyard, Sorel, a powerful steel, twin-screw, hopper, hydraulic dredge, at an estimated cost of $350,000.

The Director of the Shipyard at Sorel estimated that it would take a year and a half to build and equip this very large and powerful machine, which was carefully designed for that special work.

The hull of the dredge, over 250 feet long, was successfully launched on December 1, 1906, and it is hoped the vessel will be ready to commence work on the St. Thomas shoals early in the season of 1907.

In March, 1906, the Department received very strong representations that these improvements could not be delayed, and that to wait till 1907 to make a commencement would seriously menace the proposed plans for a largely improved steamship service.

The nature of the work below Quebec, the exposed position, want of shelter, and high tides and changing currents, made the ordinary American type of dredge out of the question.

The self-propelling, sea-going, hopper type, as almost altogether used in Great Britain, being required, inquiries were made from the dredge builders in Great Britain and ship agents, for a dredge immediately available, suitable for this work.

The builders had none on hand and the only suitable ones offered were in Australia and South Africa. Messrs. Ferguson Brothers, one of the largest firms building dredging and harbour plant, wrote stating that there was not a hopper dredger of the capacity mentioned to be bought in England. Messrs. Wm. Simons & Company, also large and successful dredge builders, wrote that all their large dredges were fully employed, and that they did not know of any to be disposed of for some considerable time, and that they did not think there was a possibility at that time of procuring a second-hand hopper dredger, either of the hydraulic or bucket ladder type.

A Dutch pump dredge, at New Orleans, was offered by Messrs. H. E. Moss & Company, of Liverpool, England, for £34,000.

The price being very reasonable, on authority of Council, the Minister ordered an examination with a view to purchase. The only objection to this dredge was that it had no cutter, and therefore not suitable for dredging anything but sand or soft silt.

A visit was made to Galveston Harbour, where three smaller dredges of the same design and type were working. The results of the working of these dredges were very satisfactory, and it was certain that this dredge would be very valuable for many places in Canada, and was very cheap at the price.

By cable the offer of Messrs. Moss & Co. was reduced to £30,000, and the dredge was purchased on April 20, at that price, or $146,000, with interest to date of payment.

The vessel was docked and made ready for the long voyage, and all expenses of repairs, wages, provisions, stores, &c., until the dredge reached Quebec, amounted to $10,942.14 and $4,574.17 insurance.

The general dimensions and particulars of the *Galveston,* a steel, twin-screw, suction, hopper dredge, are as follows:—

Length, 233 feet; breadth, 39 feet; depth, 15 feet 5 inches.
Draught when laden with 1,800 tons, 14 feet 9 inches aft, 13 feet 1 inch forward.
Dredges to 55 feet and raises 1,350 cubic yards in 45 minutes.
Hopper capacity about 1,400 cubic yards.
Built in 1904.
Engines, 2 triple expansion, about 600 I.H.P. each
Cylinders, 15¾ inch., 24 in. and 37½ in. diameter. Stroke, 17¾ in.
Two boilers. Two suction pumps, Dutch type, 8 feet 6 inches outside dia.
Speed, loaded, 9 miles.
Electric light. Ample crew accommodation.
Arranged for pumping dredged material ashore at a distance of 1,500 to 1,600 feet.

The *Galveston* reached Quebec on July 1, having been 29 days on the voyage from New Orleans, under her own steam.

Repairs and fitting out and the organization of a crew were immediately proceeded with, and the dredge commenced work on August 11.

The usual difficulties were encountered in training the crew, overcoming the difficulties in holding the vessel in the changing currents, and in holding the fine sand in the hoppers.

The dredge, however, much more than fulfilled the expectations, and realized a substantial improvement to the amount of nearly 100,000 cubic yards, before the close of the season of 1906.

The dredge was caught in the very severe gale of October 7 and, for a time, ran a great risk of being wrecked. The ten-ton suction pipe and derrick broke loose from lashings and had to be let go to save the ship. The pipe was recovered in a couple of days, but the derrick could not be found and lifted for some time, owing to a succession of gales. Everything was, however, recovered and put in order again, and the dredge finished the season on November 9.

The *Galveston* was then sent to St. John, N.B., to remove the silt which had filled up the Intercolonial Railway berths.

SESSIONAL PAPER No. 21

COST OF SHIP CHANNEL TO DATE.

TABLE showing the Total Cost of the Dredging and Plant, and the Quantities dredged to June 30, 1906.

	Cost of Dredging.	Expenditure for Plant, Shops, Surveys, &c.	Quantities Dredged.
Montreal Harbour Commissioners, 1851 to 1888.	$ cts.	$ cts.	Cubic yards.
Dredging Montreal to Cap à la Roche to 27½ feet at ordinary low water, and from Cap à la Roche to Quebec to 27½ feet at half tide	3,402,494 35	534,809 65	19,865,693
Department of Public Works.			
Dredging consisting of widening and cleaning up of channel; deepening Cap à la Roche to Cap Charles to 27½ feet at ordinary low water, and dredging at Grondines, Lotbinière, and Ste. Croix, 1889 to June 30, 1899	829,583 08	486,971 79	3,558,733
Project of 1899—Dredging channel between Montreal and Quebec to 30 feet at lowest water of 1897, also widening to a minimum width of 450 feet and straightening—			
Fiscal year 1899–1900	100,191 01	265,270 78	1,107,894
" 1900–1901	136,680 83	287,040 04	2,479,385
" 1901–1902	185,429 80	479,731 47	3,098,350
" 1902–1903	255,776 55	277,703 50	6,544,605
" 1903–1904	276,958 59	308,765 44	4,619,260
Department of Marine and Fisheries.			
Fiscal year 1904–1905	311,087 93	266,460 33	2,716,220
" 1905–1906	431,768 30	125,107 37	4,047,530
	5,929,970 44	3,031,860 37	48,037,670

DREDGES.

Laval (No. 1.)—Of the fleet ship channel dredges, this is the oldest. The hull is of wood, constructed in Ottawa in 1894. The buckets are made of cast steel for work in rock and other hard material. The details of the operations of this dredge for the fiscal year were as follows:—

From the commencement of the fiscal year until July 15, 1905, the *Laval* worked at widening and deepening the channel at Becancour traverse, the material consisting of hard clay and stones. She was then laid out to straighten, widen, and deepen, the channel at Cap Madeleine, where she continued to work until August 7, the material being also hard clay and stones. The dredge was then taken up to work at Longueuil to widen and deepen the channel in Montreal harbour, where the material was exceedingly hard and tough, consisting of hardpan, clay, stones, and some shale rock. She continued to work there until taken into winter quarters, on November 25. During the winter this dredge was put in good order for the next season's work.

On the opening of the season of 1906, the *Laval* was taken back to work at Longueuil, on April 23, where she continued until the end of the fiscal year.

In a total of 185 days during which this dredge was at work, her machinery was in actual operation 62 per cent of the full working time.

The total quantity dredged amounted to 144,000 cubic yards, all very hard material, at a cost of $50,828.47, or 35·29 cents per cubic yard.

Laurier (No. 2.)—The hull of this dredge is also of wood, having been constructed at the Government Works at Sorel in 1897. Her buckets were formerly of large size, built up from cast steel bottoms, for working in soft material. As almost all the work in soft material was completed, the buckets were changed during the winter of 1903-4, and replaced by smaller and stronger buckets, having sufficient teeth for working in hardpan, &c.

During the winter of 1904-5 this dredge was thoroughly overhauled and had the above water parts of the hull rebuilt. Additional quarters were also provided for the crew.

From the commencement of the fiscal year until October 17, 1905, the *Laurier* worked at widening and deepening the channel between Pointe Citrouille and Champlain, the material being clay, sand, and a few stones. When the material found became too hard for the dredge, she was then taken up to work on the channel between Sorel and Ile de Grace where she worked until taken into winter quarters, on November 28, the material being soft clay.

This dredge, with three others, was used for a short period during the month of September in holding and floating the Allan Line R.M.S. *Victorian,* which was aground at Cap Charles, where there was danger of swinging around and blocking the channel.

The *Laurier* was laid out to commence the season's work on April 25, 1906, on the channel between Sorel and Ile de Grace, and continued working there until May 19, when she was taken down to work on Batture Perron, Batiscan, to widen, deepen, and straighten the channel, where she was still at work at the end of the fiscal year; the dredged material being clay, sand, and some stones.

The number of days during which this dredge was in operation was 185, and the percentage of time at actual work, 63.

During the fiscal year she removed 408,350 cubic yards at a total cost of $49,255.65, or 12·06 cents per cubic yard.

Lady Aberdeen (No. 3).—The hull of this dredge is of steel, the vessel complete, having been constructed at the Sorel works in 1900. The buckets were originally designed for working in soft material, but were replaced by a complete new set of cast steel buckets, especially designed for working in rock or other hard material.

At the commencement of the fiscal year this dredge was working at Champlain curve, widening and deepening and remained there until August 11, 1905, when she left to replace dredge *Lafontaine* on Becancour traverse, which having broken down had to be taken to Sorel for repairs.

The material was exceedingly tough and difficult to dredge, consisting of hardpan and embedded boulders.

After the *Lady Aberdeen* had finished her cut on Becancour traverse, she was laid out at Cap Madeleine on September 14, where Dredge *Laval* had left off, to go to Longueuil.

The work was finished at Cap Madeleine on September 22, and the dredge was taken down to Champlain curve to replace Dredge *Lafontaine,* removed to work at Longueuil. The *Lady Aberdeen* continued to work on Champlain curve till she was taken to Sorel for the winter on November 24, 1905.

This dredge was also used with three others for a short period during the month of September in connection with the floating of the R.M.S. *Victorian.*

On the opening of the season of 1906, the *Lady Aberdeen* was taken back to work on Champlain curve on April 28, the material consisting of hard clay, stones, and some sand. She was still working there at the end of the fiscal year.

The working time of the *Lady Aberdeen* was 180 days, the dredge being in actual operation 70 per cent of the full working time.

The total number of cubic yards removed amounted to 270,700, at a total cost of $46,886.99 or 17·32 cents per cubic yard.

Lady Minto (No. 4).—Dredge No. 4 is of the same type and design as the *Lady Aberdeen.* During the winter of 1903-4, the buckets were replaced by a complete new set of cast steel buckets for working in rock and hard material.

At the commencement of the fiscal year, this dredge was working at Becancour curve, the material being very hard, consisting of hard clay and stones. On finishing her cut there she was laid out to work at Cap Madeleine on July 11, 1905, to widen and deepen the channel, the material being, also, hard clay and stones. When the dredge had finished there on October 4, she was taken to clean up some lumps found by testing at Becancour channel, and traverse, and at Cap Madeleine. When the dredge had finished cleaning up the lumps she was taken down to Champlain on October 17, to replace Dredge *Laurier,* as the material was too hard for that dredge.

The *Lady Minto* continued to work on the channel between Champlain and Pointe Citrouille until November 16. She was then taken to work on the channel between Sorel and Ile de Grace, and worked there until November 28, 1905, when she was taken into Sorel for the winter.

This dredge was also used for a short period during the month of September in connection with the floating of R.M.S. *Victorian,* aground at Cap Charles.

During the winter the dredge was overhauled and put in good order for next season's work.

On April 26, 1906, she left Sorel, and was laid out to work on the channel between Sorel and Ile de Grace, where she worked until May 24, when it was decided to take the dredge to Montreal and put her into dry dock, as she was leaking badly. The vessel was in Tate's dry dock until May 30, and the hull was well repaired. The dredge was then taken down to Horseback shoal, Grondines, to straighten a caved-in bank, on the south side of the channel, the material being gravel, stones and boulders. This work required the use of a stone lifter most of the time. After finishing at Grondines, the dredge was taken to Batiscan and was laid out on June 5, on Batture Perron, to straighten, widen, and deepen the channel there, the material consisting of clay, sand, and stones. The dredge finished her cut on June 20, and was then taken down to Bastiscan traverse, and put to work to widen and deepen the channel there, the dredged material being clay with some large stones. At the end of the fiscal year this dredge was still working on Batiscan traverse.

The number of days during which this dredge was in operation was 184, and the percentage of time of actual work, 66.

During the fiscal year 278,650 cubic yards were dredged, at a total cost of $50,739.82 or 18·20 cents per cubic yard.

Lafontaine (No. 5).—The hull of this dredge is of wood, the work of the Sorel ship-yard, completed in 1901. She was fitted out with large, but very strong built up buckets for fairly soft material, but during the winter of 1904-5, these were replaced by a complete new set of cast steel buckets for working in rock and other hard material.

From the commencement of the fiscal year until August 2, 1905, the *Lafontaine* worked on Becancour traverse, where the material was exceedingly tough and difficult to dredge, consisting of hard-pan and embedded boulders. The dredge having broken one of her large spur wheels, she was taken to Sorel for repairs. After being repaired, she was taken down to replace dredge *Baldwin* on Champlain curve, on August 10, the *Baldwin* being taken to work on the Channel at Longueuil.

She worked at Champlain until September 22, when she was taken up to work at Longueuil to replace the *Baldwin,* as the material was too hard for that dredge, being very hard clay, stones, and some shale rock. The *Lafontaine* worked there widening, deepening, and straightening the channel until November 24, 1905, when she was taken to Sorel for the winter.

This dredge was one of the four used for a short period during the month of September, in connection with floating the Allan R.M.S. *Victorian* aground at Cap Charles.

During the winter the dredge was overhauled, and a complete new set of bucket teeth put on.

On the opening of the season of 1906 this dredge commenced operations at Longueuil shoal, on April 24 the material being very difficult to dredge, composed of hardpan, and some stones. At the end of the fiscal year, the *Lafontaine* was still working at Longueuil.

The working time of the *Lafontaine* was 185 days, the dredge being in actual operation 71 per cent of the full working time.

The total number of cubic yards removed amounted to 213,600, at a total cost of $55,736.39, or 26·09 cents per cubic yard.

Baldwin (No. 6.)—This is the newest vessel of the elevator dredge fleet. The hull is of wood constructed at the Sorel Shipyard in 1902.

During the winter of 1903-4, the buckets were rebuilt and strengthened, and during the winter of 1904-5, sufficient teeth were added to the buckets for working in hardpan, &c.

At the commencement of the fiscal year the *Baldwin* was working on Champlain curve, and continued working there until August 10, 1905, when the dredge was taken to Longueuil shoal to work at widening, straightening, and deepening the channel in Montreal harbour. On the way up, the dredge stopped at Sorel for a couple of days to have some new teeth put in, and other repairs done before being put to work at Longueuil, where the dredging material was very hard.

This dredge was laid out on August 14 on the north side of the channel. She worked there until September 25, when she was replaced by dredge *Lafontaine*, owing to the material being too hard. The *Baldwin* was taken down and laid out to work on the channel between Sorel and Ile de Grace, the material being soft clay, and continued to work there until taken into winter quarters, on November 28, 1905.

On April 24, 1906, the *Baldwin* was taken back to work on the channel between Sorel and Ile de Grace, and at the end of the fiscal year, was still working there.

The number of days during which this dredge was in operation was 186, and the percentage of time at actual work 74.

The total number of cubic yards removed amounted to 747,720, at a cost of $55,640.95, or 7 $^{44}/_{100}$ cents per cubic yard, an exceedingly good record.

J. Israel Tarte (No. 7.)—This hydraulic dredge is one of the newest vessels of the ship channel dredging fleet, and a new departure as regards plant for the improvement of navigation in Canada. She was constructed in 1902, by the Polson Iron Works Company, of Toronto, Canada.

The hull is of steel, of the same type and general design as the steel hulls of the elevator dredges.

At the commencement of the fiscal year this dredge was working at the foot of Lake St. Peter, at No. 3 Curve, and after finishing the curve, the dredge continued to work on the channel between No. 3 Curve and the White Buoy Curve, deepening and widening, the material being soft blue clay. She was taken into winter quarters on November 16, 1905.

During the month of July the dredge lost several days on account of the cutter head breaking off, to recover which, the use of a stone lifter was required.

Delay was caused during the month of August on account of the dredge working opposite the new pier which was being built for the lighthouse at No. 3 Curve, owing to the great care that had to be taken to prevent the pontoons being damaged against the pier.

During September the cutter shaft broke, and had to be replaced.

The boilers, owing to the very heavy duty required, also gave trouble by leakages, which necessitated a good deal of repair work.

In October and November long delays were caused and time lost through wind, breakages and steamships.

During the winter a great deal of repair work was done to the boilers to put them in good order for the next season's work. The dredge generally was given a good overhauling.

On April 30, 1906, the dredge was laid out to work where she left off on November 16, 1905, on the channel between No. 3 Curve and White Buoy Curve, but as it was decided not to do any more widening until the whole channel in Lake St. Peter was deepened to 30 feet, and the work of deepening the old channel to the width of 300 feet was hurried with all possible vigour.

During the month of May, delays were caused through winds and ordinary breakages, but during June the boilers began to leak badly, and after being inspected by the boiler inspector, Mr. Samson, orders were given on June 20 to take the dredge to Sorel to have them repaired.

At the end of the fiscal year the dredge was still at Sorel undergoing repairs.

In the 160 days, the dredge was in actual operation 56 per cent of the full working time.

The total number of cubic yards removed amounted to 1,984,510, at a cost of $117,668.03, or an average of 5 $^{92}/_{100}$ cents per cubic yard.

The total number of cubic yards removed by the dredging fleet during the fiscal year ending June 30, 1906, amounted to 4,047,530, at a cost of $426,756.30, or an average of 10 $^{54}/_{100}$ cents per cubic yard.

GENERAL NOTES.

The announcement of the completion of an available channel for navigation between Quebec and Montreal of 30 feet at extreme low water an increase of nearly 4 feet, is of very great importance to the trade of Canada.

The dredging was completed late in November, and all swept, and at the opening of navigation in 1907 the Sorel gauge will be corrected, giving an extra 3 feet 10½ inches.

Although every part of the channel in doubt has been carefully tested, it is the intention, as soon as possible after the ice leaves the river next spring, that the sweeping tug *Lady Grey* will start from Montreal, and run three lines of sweeping to the full depth as indicated by the Sorel gauge and the semaphores, to assure that nothing has been left to be of the slightest obstacle to the full depth indicated.

The success is not attended without difficulty and anxiety. The dredges are operated 132 hours per week, or steadily from midnight on Sunday until noon on Saturday. Stops are only made for repairs, for shifting from one place to another, bad weather, or to give room for passing vessels. Coal is supplied by barges without stopping the work.

The constant steady work in exceedingly hard material, at a depth of from 32 to 42 feet, is very hard on machinery. Only the very best designed and well constructed plant can stand it. Traffic must not be interrupted, and the work must always be carried on in the more or less swift current.

The material is increasing in hardness from year to year, as the work nears Quebec. All the soft material, except the remainder of the work in Lake St. Peter, is now completed. A dredge that can remove 6,000 yards per day in soft material, without trouble, is more fatigued by dredging 1,000 yards of hard-pan, in which boulders are imbedded.

The best and most efficient plant is an absolute necessity.

All the superintendence and management devolves on the officers of the department.

The construction and repairs and the management of the Sorel works are in charge of Mr. G. J. Desbarats, C.E., Director of the Shipyard at Sorel.

The design of the improvements, the engineering branch, as well as the superintendence of the operations are directly under the Superintending Engineer.

The work of the very efficient staff and the details of the placing of the dredges are conducted by Mr. V. W. Forneret, C.E., in a very able manner.

About 400 men are employed in connection with the dredging operations. These men, all sailors, were born and brought up at Sorel or at some of the parishes bordering on the River St. Lawrence. Most of them have been trained to the service from boy-

hood. The senior captain of the fleet makes the statement that he has never earned a cent in any other service. A great deal of the success of the operations is due to this good training. The work requires extraordinary care and great patience, the machinery being forced to the utmost, and passing vessels requiring to be constantly watched for.

A captain and an engineer are in general charge respectively of the vessel and machinery. The remainder of the crew is divided into two watches, and works in shifts of 6 hours. At noon on Saturday the work stops.

Only two holidays, Dominion Day and Labour Day, are given throughout the season. The boarding of the men is done by contract with the captain of the vessel, at so much per man.

In making up the cost of the work of dredging, everything is included, except interest on the capital expenditure and depreciation. The principal items of cost are wages, fuel, board, stores and repairs, as well as general expenses and superintendence. The item of repairs includes keeping the plant in constant good order, but not new improved machinery. The cost of operating an elevator dredge, with its attendant plant, amounts to about $45,000 per annum. The cost of operating the hydraulic dredge amounts to about double that sum.

It takes ten years to give an increase of depth of four feet. In much less than that time the maximum size of the ships using the channel has increased from 6,000 to 12,000 tons. Now 15,000-ton vessels are proposed.

That the channel of to-day will accommodate the commerce of ten years hence is not to be expected by even the most unimaginative, and it is recognized that we must build for the future. The capacity of the River St. Lawrence for navigation should grow with the country, as even now, to a large extent, the size of the vessel decides the economy of transportation.

TABLES.

The following tables show in a concise form the progress to date, the details of the operations of the different dredges, the classification of the expenditure, the cost per yard in each locality and the expenditure at Sorel in connection with new plant and the Shipyard generally:—

PROGRESS of the Dredging Operations at the date of Writing the close of the Season of 1906.

Locality.	Distance English Miles.	Total Length Requiring Dredging.	Length Dredged in 1906.	Total Length of 30 Feet Channel Dredged.	Length yet to be Dredged.
		Miles.	Miles.	Miles.	Miles.
Division 1 :— Montreal to Sorel.	45	22.90	0.70	22.90	All completed.
Division 2 :— Sorel to Batiscan.	36	12.45	1.30	12.20	0.25
Division 3 :— Lake St. Peter.	26	18.00	4.60	*12.30 † 5 70	All completed. 12.30 Miles to be widened.
Division 4 :— Batiscan to Quebec.	59	10.00	2.00	2.90	7.10
Division 5 :— Quebec to The Traverse.	60	6.65	.....	.....	6.65
	220	70.00	8.60	56.00	14.00

* Not widened. † Widened.

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PROGRESS of the Dredging Operations at the date of writing, the close of the season of 1906.

Locality.	LENGTH OF DREDGING.		Cubic Yards yet required to be done.
	Required.	Done.	
	Miles.	Miles.	
Division 1 :—			
Longueuil Shoal		1·10	
Longue Pointe to Pointe aux Trembles (E.H.)		5·05	
Ile Ste. Thérese		0·40	
Varennes to Cap. St. Michel		3·00	
Cap St. Michel to Vercheres		4·50	
Vercheres Traverse		1·10	
Vercheres to Contrecœur		1·70	
Contrecœur Channel		6·05	
Total		22 90	
Division 2 :—			
Sorel to Ile de Grace		4·40	
Stone Island		1·10	
Isle aux Raisins	0·15	0·10	25,000
Lake St. Peter (See Div. 3.)			
Port St. Francis		0·50	
Three Rivers		0·50	
Cap Madeline to Bécancour		1·55	
Bécancour to Champlain		2·25	
Champlain to Pointe Citrouille		1·30	
Batture Perron	0·10	0·50	10,000
Total	0·25	12·20	35,000
Division 3 :—			
Lake St. Peter		*12·30	9,300,000
		†5·70	
Total		18·00	9,300,000
Division 4 :—			
Batiscan to Cap Levrard	1·20	1·80	500,000
Cap à la Roche Channel	1·80	0·20	1,050,000
Pouillier Rayer	1·20		500,000
Cap Charles	0·90		500,000
Grondines	0·80		200,000
Lotbinière		0·40	
Cap Santé		0·20	
Ste. Croix	0·60	0·30	150,000
St. Augustin	0·60		150,000
Total	7·10	2·90	3,050,000
Division 5 :—			
Quebec to the Traverse	6·65		5,600,000
Total	6·65		5,000,000
Totals	14·00	56·00	17,385,000
Cubic yards yet to be done			17,385,000
Cubic yards done			48,037,670
Total			65,422,670

* Not widened. † Widened.

RIVER ST. LAWRENCE SHIP CHANNEL.

ABSTRACT of work of Dredging Fleet during the fiscal year ended June 30, 1906.

Dredge.	Locality of Dredging.	Time of Service.	Nominal working time, 24 hours per day.	Hours Actual Dredging.	Number of Scows filled.	Number of Cubic Yards dredged (scow measurement).	Depth of Dredging at Low Water.	Width.	Character of Soil.	Remarks.
		Days.	Hours.				Ft. In.	Feet.		
Laval (No. 1).	Beaucour	12	264	141½	21	4,200	30 0	450	Hard clay and stones...	Capt. R. Matte.
	Cap Madeleine.....	20	444	286½	71½	14,350	30 0	450	" " ...	
	Longueuil	153	3,360	2,104½	813½	125,450	30 0	500 to 700	Hardpan, clay, stones and some shales.	
		185	4,068	2,532¼	906¼	144,000				
Laurier (No. 2).	Champlain..... ...	91	2,004	1,195	735¾	147,150	30 0	450	Clay and sand	Capt. C. Gendron.
	Ste. Anne de Sorel. ...	58	1,272	783¾	901	195,700	30 0	450	Clay	
	Batture Perron	36	792	564¼	262	65,500	30 0	450	Clay, sand and stones...	
		185	4,068	2,543	1,898¾	408,350				
Lady Aberdeen (No.3)	Champlain..	147	3,228	2,379	1,271½	254,300	30 0	450 to 750	Sand, hard clay and stones	Capt. O. Gaucher.
	Becancour	22	480	262¼	62	12,400	30 0	450	Hard clay and stones....	
	Cap Madeleine...	11	252	110¾	20	4,000	30 0	450	Clay and stones.. . ..	
		180	3,960	2,752	1,353½	270,700				
Lady Minto (No. 4).	Becancour	18	396	279¼	114	22,800	30 0	450 to 750	Hard clay and stones....	Capt. B. Ladebauche.
	Cap Madeleine.....	72	1,584	1,028½	340½	68,100	30 0	500	" " ...	
	Champlain	27	600	422¾	179	35,800	30 0	450	Hard clay, sand and stones	
	Ste. Anne de Sorel .	40	876	535	435¾	87,150	30 0	450	Soft clay	
	Batture Perron	15	336	251	187	37,400	30 0	450	Clay, sand and stones...	
	Batiscan Traverse. . ..	9	192	144½	136	27,200	30 0	450	Grey clay with large stones.	
	Grondines (clearing caved bank)..	3	60	9	1	200	27 6	300	Gravel and stones.....	
		184	4,044	2,670	1,393¼	278,650				

Lafontaine (No. 5) ..	Becancour	30	660	463¼	72	21,600	30	0	450	Hard clay and stones....	Capt. A. Marcotte.
	Champlain.....	41	900	489½	190	57,000	30	0	450 to 750	" "	
	Longueuil	114	2,508	1,930	450	135,000	30	0	500 to 700	" "	
		185	4,068	2,882¾	712	213,600					
Baldwin (No. 6)....	Champlain..	36	792	592¼	218	64,500	30	0	450 to 750	Clay, sand and stones...	Capt. L. Dauphinais.
	Longueuil	37	816	626¼	124	36,720	30	0	500 to 700	Hard clay and stones..	
	Ste. Anne de Sorel	113	2,484	1,821¾	2,155	646,500	30	0	450	Clay.....	
		186	4,092	3,040¼	2,497	747,720					
J. Israel Tarte (No.7)	Lake St. Peter	160	3,556	1,985½	... .	1,984,510	30	0	300 to 650	Soft blue clay..... ..	Capt. J. L. Michaud.
						4,047,530					

RIVER ST. LAWRENCE SHIP CHANNEL BETWEEN MONTREAL AND QUEBEC.

Classification of Disbursements for Fiscal Year ended June 30, 1906.

Vessels.	Fuel.	Wages.	Board.	Stores and materials.	Repairs—Labour.	Expenditure New Plant, Rebuilding, Shipyard, &c.	Proportion of General and Office Expenses, &c.	Expenditure for each vessel.	Stone-lifter Service Elevator Dredges.	Tug Service.	Inspection Towing, Sweeping, &c.	Total cost of operations of each Dredge and Plant during Fiscal Year.	Total Expenditure on different appropriations.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Dredge Laval (No. 1)	7,192 94	7,254 12	2,570 62	1,791 19	11,670 10		5,272 78	35,751 75	640 39	8,008 35	6,427 98	50,828 47	
Tug Portneuf	1,146 80	2,952 52	1,078 35	762 86	823 59		1,244 23	8,008 35					
Dredge Laurier (No. 2)	6,271 74	7,097 96	2,575 38	2,223 06	9,248 50		4,712 08	32,128 72	640 38	10,058 56	6,427 99	49,255 65	
Tug Cartier	1,837 70	4,052 28	1,592 25	483 36	536 79		1,556 18	10,058 56					
Dredge Lady Aberdeen (No. 3)	6,974 38	5,912 18	2,507 83	2,150 56	8,096 56		4,391 28	30,062 79	640 39	9,755 83	6,427 98	46,886 99	
Tug Emilia	1,734 30	3,722 10	1,373 13	484 31	932 58		1,509 44	9,755 83					
Dredge Lady Minto (No. 4)	5,985 04	7,084 09	2,542 98	2,388 97	11 666 02		5,125 71	34,792 81	640 38	8,878 65	6,427 98	50,739 82	
Tug Champlain	1,325 40	3,857 73	1,385 10	378 49	558 69		1,373 24	8,878 65					
Dredge Lafontaine (No. 5)	8,256 82	6,109 65	2,586 54	2,174 85	11,675 55		5,334 54	36,137 95	640 39	12,530 06	6,427 99	55,736 39	
Tug Lac St. Pierre	2,838 80	3,953 30	1,543 67	872 19	1,384 26		1,937 84	12,530 06					
Dredge Baldwin (No. 6)	7,235 24	7,124 08	2,554 09	2,012 25	12,400 19		5,430 57	36,756 42	640 38	11,816 17	6,427 98	55,640 95	
Tug St. Jean Iberville	2,105 60	4,058 68	1,597 12	616 92	1,608 52		1,829 33	11,816 17					
Dredge J. Israel Tarte (No. 7)	30,124 05	13,486 94	4,209 93	10,699 73	16,041 76		12,873 55	87,435 96		17,376 09	12,855 98	117,668 03	426,756 30
Tug Montcalm	2,063 30	4,110 71	1,563 78	635 59	1,141 47		1,747 68	11,262 53					
" Carmelia	1,090 40	2,215 14	750 17	460 15	647 65		950 03	6,113 56					
Tug Jesse Hume (Divided ½ to each elev. dredge)	1,128 00	2,355 58	853 93	581 92	363 09		964 75	6,247 22					
Str. Eureka (Divided ½ to each elev. dredge)	1,480 50	2,910 70	1,561 13	1,186 07	836 42		1,466 92	9,441 74					
" Frontenac (Add ½ to hyd. dredge)	2,749 50	5,690 79	3,383 16	2,390 16	2,773 25		3,115 61	20,102 47					
" Jas. Howden (Add ½ to hyd. dredge)	2,954 65	4,367 84	2,516 72	1,861 36	1,510 29		2,421 59	15,632 45					
Stone-lifter No. 2 (Divided equally between elev. dredges)	51 70	670 82	219 45	80 64	139 60		213 61	1,375 82					
" No. 3 (Divided equally between elev. dredges)	145 70	1,111 92	343 67	229 28	252 97		382 95	2,466 49					
Dredging at Longueuil—													
Dredge King Edward, W. J. Poupore Co. Ltd.													
Dredging								4,970 00					5,012 00
Inspection								42 00					
Construction for dredging fleet—													
Floating machine shop						494 41							
Tug Portneuf (No. 10)						5,931 23							

Tug (No. 16)						149 63							
Reconstruction dumping scows Nos. 1 & 3						4,219 88							
" " No. 2						1,933 65							
New upper works tug Jesse Hume						4,881 08							17,609 94
Improvements to shipyard													
Power-house						9,158 07							
Electric plant						21,572 47							
Wharf No. 4						8,814 19							
Pile driver						1,848 75							
Saw-mill						41,262 72							
Boiler shop, new tools and machinery						10,304 17							
Blacksmith's shop "						1,746 30							
Machine shop "						195 35							
Steam fitter shop "						381 72							
Ship yard water works						6,183 28							
" " railway						1,399 13							102,866 15
Stores and materials						4,631 28							4,631 28
	94,692 56	100,129 13	39,308 97	34,463 91	94,307 85	125,107 37	63,853 88	431,768 30	3,842 31	78,423 71	51,423 88	426,756 30	556,875 67

RIVER ST. LAWRENCE SHIP CHANNEL BETWEEN MONTREAL AND QUEBEC.

DETAILS of Dredging, Locality and Cost per Cubic Yard for Fiscal Year ended June 30, 1906.

Dredges.	Total Cost of Operations of each Dredge and Plant during Fiscal Year.	Number of Days in Operation, each Dredge.	Cost per Day, Operations of Dredge and Plant.	Days working each Locality.	Cost of Work, each Locality.	Total Cost of Operations of each Dredge.	Number of Cubic Yards dredged, each Locality.	Total Cubic Yards for each Dredge.	Cost per Cubic Yard, each Locality.	Average Cost per Cubic Yard for each Dredge.	Kind of Material Dredged.	Locality of Dredging.
	$ cts.	$ cts.	$ cts.		$ cts.	$ cts.			Cts.	Cts.		
Laval (No. 1	50,828 47	185	274 74	12	3,296 97		4,200		78 49/100		Hard clay and stones	Bécancour.
			274 74	20	5,495 00		14,350		38 28/100		" "	Cap Madeleine.
			274 74	153	42,036 50		125,450		33 50/100		Hard-pan clay, stones and some shale.	Longueuil.
						50,828 47		144,000		35 29/100		
Laurier (No. 2)	49,255 65	185	266 24	91	24,228 44		147,150		16 45/100		Clay and sand	Champlain.
			266 24	58	15,442 27		195,700		7 89/100		Clay	Ste. Anne de Sorel.
			266 24	36	9,584 94		65,500		14 64/100		Clay, sand and stones	Batture Perron.
						49,255 65		408,350		12 06/100		
Lady Aberdeen (No. 3)	46,886 99	180	260 48	147	38,291 04		254,300		15 05/100		Sand, hard clay and stones	Champlain.
			260 48	22	5,730 63		12,400		46 21/100		Hard clay and stones	Bécancour.
			260 48	11	2,865 32		4,000		71 63/100		Clay and stones	Cap Madeleine.
						46,886 99		270,700		17 32/100		
Lady Minto (No. 4)	50,739 82	184	275 75	18	4,963 67		22,800		21 77/100		Hard clay and stones	Bécancour.
			275 75	72	19,854 72		68,100		29 15/100		" "	Cap Madeleine.
			275 75	27	7,445 47		35,800		20 79/100		" "	Champlain.
			275 75	40	11,030 36		87,150		12 65/100		Soft clay	Ste. Anne de Sorel.
			275 75	15	4,136 42		37,400		11 05/100		Clay, sand and stones	Batture Perron.
			275 75	9	2,481 87		27,200		9 12/100		Grey clay with large stones	Batiscan Traverse.
			275 75	3	827 31		200		413 85/100		Gravel and boulders	Grondines (clearing caved bank).
						50,739 82		278,650		18 20/100		
Lafontaine (No. 5)	55,736 39	185	301 27	30	9,038 32		21,600		41 84/100		Hard clay and stones	Bécancour.
			301 27	41	12,352 39		57,000		21 67/100		" "	Champlain.
			301 27	114	34,345 68		135,000		25 44/100		" "	Longueuil.
						55,736 39		213,600		26 09/100		
Baldwin (No. 6)	55,640 95	186	299 14	36	10,769 22		64,500		16 69/100		Clay, sand and stones	Champlain.
			299 14	37	11,068 40		36,720		30 14/100		Hard clay and stones	Longueuil.
			299 14	113	33,803 33		646,500		5 22/100		Clay	Ste. Anne de Sorel.
						55,640 95		747,720		7 44/100		
J. Israel Tarte (No. 7)	117,668 03	160	735 42	160	117,668 03		1,984,510				Soft blue clay	Lake St. Peter.
Dredge King Edward, W. J. Poupore Co. Ltd.						117,668 03		1,984,510		5 92/100		
	. ....	.....	.....	....	5,012 00	5,012 00	14,200	14,200	.....	35 29/100	Hard clay and stones	Longueuil.
	426,756 30	1,265	.....	1,265	431,768 30	431,768 30	4,061,730	4,061,730				

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DREDGING PLANT.

The following is a description of the dredging plant in November, 1906, owned and operated by the Department of Marine and Fisheries in connection with the River St. Lawrence Ship Channel:—

DREDGES.

The Elevator Dredge 'Laval' (No. 1) wooden hull.

Length over all, 150 feet.
Breadth of beam, 30 feet.
Depth of hold, 14 feet.
Average draught, 11 feet.
Greatest working depth, 43·5 feet.
Hull built in Ottawa in 1894.
Steel buckets.
Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

The Elevator Dredge 'Laurier' (No. 2), wooden hull.

Length over all, 168 feet.
Breadth of beam, 32 feet.
Depth of hold, 14 feet.
Average draught, 10 feet.
Greatest working depth, 42·5 feet.
Built at Sorel shipyard in 1897.
¾ cubic yard buckets for hard-pan.
Working capacity per day in fairly stiff clay, 2,000 to 3,000 cubic yards.

The Elevator Dredge 'Lady Aberdeen' (No. 3), steel hull.

Length over all, 148 feet.
Breadth of beam, 32 feet.
Depth of hold, 13 feet.
Average draught, 8·5 feet.
Greatest working depth, 42·5 feet.
Built at Sorel shipyard in 1900.
Steel buckets.
Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

The Elevator Dredge 'Lady Minto' (No. 4), steel hull.

Length over all, 148 feet.
Breadth of beam, 32 feet.
Depth of hold, 13 feet.
Average draught, 8·5 feet.
Greatest working depth, 42·5 feet.
Built at Sorel shipyard in 1900.
Steel buckets.
Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

The Elevator Dredge 'Lafontaine' (No. 5), wooden hull.

Length over all, 168 feet.
Breadth of beam, 32 feet.
Depth of hold, 14 feet.

Average draught, 9 feet.
Greatest working depth, 45 feet.
Built at Sorel shipyard in 1901.
Steel buckets.
Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

The Elevator Dredge 'Baldwin (No. 6), wooden hull.

Length over all, 165 feet.
Breadth of beam, 34 feet.
Depth of hold, 14 feet.
Average draught, 8 feet.
Greatest working depth, 45 feet.
Built at Sorel shipyard in 1902.
1 cubic yard buckets strengthened for fairly hard material.
Working capacity per day in medium material, 2,500 to 3,500 cubic yards.

The Hydraulic Dredge 'J. Israel Tarte' (No. 7), steel hull.

Length over all, 160 feet.
Breadth of beam, 42 feet.
Depth of hold, 12·5 feet.
Average draught, 6 feet.
Length of suction frame, 80 feet.
Greatest working depth, 50 feet.
Built at the Polson Iron Works, Toronto, in 1902.
Working capacity per day in soft material, 12,000 to 20,000 cubic yards.

Discharge Pipe and Pontoons of Dredge 'J. Israel Tarte' (No. 7).

23 lengths of pipe, 36 ins. diameter by 100 feet long.
1 length of pipe, 36 ins. diameter by 35 feet long.
23 pairs of pontoons for floating pipes, 42 ins. diameter by 90 feet long.

Winch Scow 'No. 3' for Dredge 'J. Israel Tarte' (wooden hull).

Length over all, 60 feet.
Breadth of beam, 18 feet.
Depth of hold, 6 feet.
Built at Sorel shipyard in 1902.

Winch Scow (wooden hull) for Dredge 'J. Israel Tarte' (with steam boiler and steam winch.

Length over all, 75 feet.
Breadth of beam, 25 feet.
Depth of beam 5·5 feet.
Built at Sorel shipyard in 1902.

The Suction, Hopper Dredge 'Galveston' (steel hull, twin screw).

Length over all, 233 feet.
Breadth of beam, 39 feet.
Depth of hold, 15 feet 5 in.
Draught when loaded with 1,800 tons, 14 ft. 9 in. aft., 31 ft. 1 in forward.
Greatest working depth, 55 feet.
Two suction pumps of Dutch type, 8 ft. 6 in. outside diameter.

Built in 1904.
Working capacity, 1,350 cubic yards in 45 minutes.
Hopper capacity, 1,400 cubic yards.

TUGS.

The Ice-breaking and Sweeping Tug 'Lady Grey' (steel hull, twin screw).

Length between perpendiculars, 172 feet.
Length over all, 183 feet 6 inches.
Breadth moulded, 32 feet.
Breadth extreme, 32 feet 3 inches.
Depth moulded, 18 feet.
Draft mean to bottom of flat plate keel (normal), 12 feet.
Draft mean, when ice-breaking, about 13 feet.
Displacement in tons at 12 ft. draft, 1,070.
Mean speed at 12 ft. draft on 6 runs over measured mile base, 14 knots.
Built by Vickers, Sons & Maxim, Ltd., Barrow-in-Furness, in 1906.

The Tug 'Frontenac' (composite hull).

Length over all, 113 feet.
Breadth of beam, 23 feet.
Depth of hold, 10 feet.
Average draught, 9 feet.
Built at Sorel shipyard in 1901.

The Tug 'Eureka' (steel hull).

Length over all, 100 feet.
Breadth of beam, 22 feet.
Depth of hold, 12 feet.
Average draught, 11 feet.
Built in Glasgow, Scotland, in 1893.

The Tug 'James Howden.' (wooden hull).

Length over all, 100 feet.
Breadth of beam, 21 feet.
Depth of hold, 10 feet.
Average draught, 7·5 feet.
Built at Sorel shipyard in 1903.

The Tug 'St. Jean-Iberville' (steel hull).

Length over all, 90 feet.
Breadth of beam, 18 feet.
Depth of hold, 12 feet.
Average draught, 10 feet.
Built at Sorel shipyard in 1897.

The Tug 'Lac St. Pierre' (wooden hull).

Length over all, 100 feet.
Breadth of beam, 21 feet.
Depth of hold, 10 feet.
Average draught, 7·6 feet.
Built at Sorel shipyard in 1901.

The Tug 'St. Francis' (wooden hull).

Length over all, 80 feet.
Breadth of beam, 17 feet.
Depth of hold, 10·8 feet.
Average draught, 9 feet.
Built in 1875.

The Tug 'Cartier' (wooden hull).

Length over all, 84 feet.
Breadth of beam, 18 feet.
Depth of hold, 9·5 feet.
Average draught, 8 feet.
Built at Sorel shipyard in 1893.

The Tug 'Emilia' (wooden hull).

Length over all, 84 feet.
Breadth of beam, 17 feet.
Depth of hold, 9 feet.
Average draught, 7·5 feet.
Built at Sorel shipyard in 1898.

The Tug 'Champlain' (wooden hull).

Length over all, 84 feet.
Breadth of beam, 17 feet.
Depth of hold, 9 feet.
Average draught, 7·5 feet.
Built at Sorel shipyard in 1901.

The Tug 'Jesse Hume' (wooden hull.)

Length over all, 72 feet.
Breadth of beam, 17·3 feet.
Depth of hold, 10 feet.
Average draught, 8·5 feet.
Built in Buffalo in 1878.

The Tug 'Montcalm' (wooden hull).

Length over all, 80 feet.
Breadth of beam, 23 feet.
Depth of hold, 8 feet.
Average draught, 6·5 feet.
Built at Sorel shipyard in 1903.

The Tug 'Carmelia' (wooden hull).

Length over all, 84 feet.
Breadth of beam, 17 feet.
Depth of hold, 9 feet.
Average draught, 7·5 feet.
Purchased in 1903.

COAL BARGES.

The Coal Barge 'No. 1' (wooden hull).

Length over all, 120 feet.
Breadth of beam, 24 feet.
Depth of hold, 10 feet.
Built at Sorel shipyard in 1898.

The Coal Barge 'No. 2' (wooden hull).

Length over all, 125 feet.
Breadth of beam, 25 feet.
Depth of hold, 11 feet.
Built at Sorel shipyard in 1900.

The Coal Barge 'No. 3' (wooden hull).

Length over all, 98 feet.
Breadth of beam, 28 feet.
Depth of hold, 12 feet.
Built at Sorel shipyard in 1902.

The Coal Barge 'No. 4' (wooden hull).

Length over all, 98 feet.
Breadth of beam, 28 feet.
Depth of hold, 12 feet.
Built at Sorel shipyard in 1903.

Stone-lifter 'No. 2' (wooden hull).

Length over all, 80 feet.
Breadth of beam, 25 feet.
Depth of hold, 9·8 feet.
Rebuilt at Sorel shipyard in 1897.

Stone-lifter 'No. 3' (wooden hull).

Length over all, 108 feet.
Breadth of beam, 34 feet.
Depth of hold, 14 feet.
Built at Sorel shipyard in 1903.

Sounding Scow (wooden hull).

Length over all, 60 feet.
Breadth of beam, 25 feet.
Depth of hold, 6 feet.
Built at Sorel shipyard in 1898.

Coal Scow 'No. 2' (wooden hull).

Length over all, 54 feet.
Breadth of beam, 18 feet.
Depth of hold, 4 feet.
Built at Sorel shipyard in 1892.

Six Lodging Scows (wooden hulls).

Rebuilt from old dump scows and fitted out as lodging scows for crews of dredges and tugs of ship channel fleet, at Sorel shipyard in 1899, 1901, and 1902.

HOPPER SCOWS.

1 Hopper Scow (wooden hull) with hydraulic power for closing gates.

Length over all, 97 feet.
Breadth of beam, 24·5 feet.
Depth of hold, 9 feet.
Capacity, 200 cubic yards.
Built at Sorel shipyard in 1897.

2 Hopper Scows (wooden hulls) with hydraulic power for closing gates.

Length over all, 90 feet.
Breadth of beam, 18 feet.
Depth of hold, 7 feet.
Capacity, 150 cubic yards.
Built at Sorel shipyard in 1898.

4 Hopper Scows (wooden hulls) with hydraulic power for closing gates.

Length over all, 97 feet.
Breadth of beam, 24 feet.
Depth of hold, 9 feet.
Capacity, 200 cubic yards.
Built at Sorel shipyard in 1899 and 1901.

5 Hopper Scows (wooden hulls) with hydraulic power for closing gates.

Length over all, 98 feet.
Breadth of beam, 24 feet.
Depth of hold, 9·5 feet.
Capacity, 300 cubic yards.
Built at Sorel shipyard, 2 in 1901, 3 in 1902.

2 Hopper Scows (wooden hulls) with hydraulic power for closing gates.

Length over all, 97 feet.
Breadth of beam, 24·5 feet.
Depth of hold, 9 feet.
Capacity, 300 cubic yards.
Built at Sorel shipyard in 1903.

APPENDIX No. 13.

ANNUAL REPORT OF THE OFFICER COMMANDING MARINE STEAMERS, &c., OF CANADA.

To the Deputy Minister of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to submit a report on the several services under my superintendence. These services embrace the following branches at headquarters:—

Dominion Steamers,
Dominion Cruisers,
Pilotage,
Investigations into Wrecks,
Fisheries Intelligence Bureau.

Separate report on investigations into wrecks forms an appendix hereto, and the reports on the work of Dominion cruisers, and Fisheries on Intelligence Bureau, will be found in the Fisheries report.

I have much pleasure in testifying to the good work done by captains and officers of the various vessels under my command during the past year.

The following vessels comprise the Dominion steamer fleet. These vessels are employed nearly exclusively in lighthouse and buoy work:—

Lansdowne,
Aberdeen,
Druid,
Brant,
Quadra,
Lady Laurier,
Gulnare,
Minto,
Stanley,
Maisonneuve,
Frontenac,
Shamrock,
Scout,
Reserve,
Champlain,
Montcalm,

The steamers *Minto* and *Stanley* keep up communication between Prince Edward Island and the mainland during the winter.

The *Gulnare* is employed in the tidal survey work, and a synopsis by Doctor W. Bell Dawson of the work done by her will be found in the chief engineer's report.

The *Gulnare* was employed at survey work in the River St. Lawrence, under Mr. J. W. Stewart, during the season of 1905.

The *Maisonneuve* is principally employed in patrolling the channel between Kingston and Quebec for the purpose of ascertaining if the buoys, &c., are in position.

The *Bayfield* is employed, under Mr. J. W. Stewart, officer in charge of the hydrographic surveys, in Lake Superior. A full report of his work will be found elsewhere.

The *Frontenac* is a powerful tug, employed in the St. Lawrence ship channel, under the direction of Mr. Cowie.

The *Shamrock* is employed under Mr. U. P. Boucher, agent of the Department of Marine and Fisheries in Montreal, in the buoy service between Montreal and Quebec.

The *Scout* and *Reserve* are two vessels employed under the commissioner of lights in the lighthouse and buoy service between Montreal and Kingston.

The cruiser fleet consists of the following ships, and a report of the work done by each will be found in the Fisheries report:—

Petrel,
Canada,
Princess,
Osprey,
Curlew,
Constance,
Falcon,
Kestrel,
Vigilant,

The following are the dimensions, speed, armament, &c., of the different vessels controlled by this department:—

'MINTO.'

The *Minto* is an iron steamer 225 feet long, 32 ft. 6 in. beam, and 20 ft. 6 in. depth, with a gross tonnage of 1,099 tons, indicated horse power 2,900. She is com-

manded by Captain A. Finlayson, and, as before stated, she is principally employed in keeping winter navigation open between P. E. Island and the mainland, but during the past season she has been very actively employed in assisting in the erection of different Marconi stations in the Gulf and River St. Lawrence, and also in testing the capabilities of these stations in regard to the distance communication can be carried on. This vessel is fitted with the Marconi apparatus.

'LANSDOWNE.'

The *Lansdowne* is a wooden steamer, commanded by Captain Bissett, employed in lighthouse and buoy work in the Bay of Fundy. She recently had new boilers fitted and she is now ready for a considerable period of further service. She is 188 feet long, 32 ft. wide, 15 ft. deep, with a gross tonnage of 680 tons.

'GULNARE.'

This vessel is commanded by Captain T. Taylor, and is employed entirely on survey work. Her dimensions are as follows:—

Steel vessel 137 ft. long, 20 ft. 5 in. broad, and 13 ft. 6 in. depth; gross tonnage, 262 tons.

'MAISONNEUVE.'

The *Maisonneuve* is a screw steamer 75 ft. 7 in. long, 9 ft. 7 in. broad, and depth of hold 7 ft. 3 in., with a gross tonnage of 26 tons.

'ABERDEEN.'

This vessel is employed in lighthouse and buoy work in the Halifax agency. She is an iron screw steamer 180 ft. long, 31 ft. broad and 16 ft. deep, with a tonnage of 674 gross. She has been fitted with Thornycroft-Marshall water-tube boilers, and they have given every satisfaction.

'PETREL.'

This vessel is a steel screw cruiser 116 ft. long, 22 ft. beam and 10 ft. 3 in. depth, with a gross tonnage of 192 tons. She has done most excellent work in Lake Erie, looking after United States fishermen, but for the last few seasons she has been found too slow to cope with the American steam tugs which are used for fishing purposes on the upper lakes. It was therefore decided to replace her with a very much larger and faster ship, and send the *Petrel* to the Atlantic coast where steam fishing vessels are not in use, and she will only have to cope with sailing schooners. She is commanded by Captain Kent.

'STANLEY.'

The *Stanley* is an iron screw steamer 207 ft. long, 21 ft. beam, and depth of hold 19 ft., with a gross tonnage of 914 tons. She is commanded by Captain A. Brown. This vessel is principally used to keep communication up between P. E. Island and the mainland during the winter season, but like the *Minto*, this year she has been employed in erecting and testing the different Marconi stations placed by the government in the Gulf of St. Lawrence.—*Fitted with Marconi apparatus.*

'OSPREY.'

This is a sailing schooner, employed in the Fisheries Protection Service on the Atlantic coast. She is 127 ft. long, and was built in Shelburne, Nova Scotia, and for some years was the fastest sailing schooner on the Atlantic coast. She is still very fast but there is no doubt that some of the United States fishing schooners are as good as she is now. She was commanded during the season by Acting Captain Graham.

'DRUID.'

The *Druid* is a lighthouse and buoy ship employed in the Quebec agency. She is a twin screw steamer 160 ft. long, breadth 30 ft., depth of hold 12 ft. 5 in., with a tonnage of 503 tons, and is fitted with triple expansion engines. She was built by Messrs. Fleming & Ferguson, Paisley, Scotland, in 1903, and is commanded by Captain Koenig.

'BRANT.'

The *Brant* is employed in the lighthouse and buoy service in Prince Edward Island. This is a wooden steamer 100 ft. long over all, 19 ft. broad and 8 ft. deep. This vessel is also employed in the fisheries protection service when necessity arises. She is commanded by Captain McKinnon.

'QUADRA.'

This vessel is employed in lighthouse and buoy service in British Columbia. She is an iron steamer 174 ft. long, 31 ft. beam, and a depth of 13 ft. 6 in., with a gross tonnage of 573 tons. She is commanded by Captain Hackett. This vessel, though doing good work on the Pacific, is not large enough or fast enough for the large number of extra aids to navigation which it is considered necessary to place on this coast, and I would recommend that a vessel more suitable for the work which has to be performed, should be built as soon as possible.

'PRINCESS.'

The steamer *Princess* was purchased during last season, and has taken the place of *La Canadienne,* and does exactly the same patrol work, under the command of Commander Wakeham. The *Princess* is a steel screw steamer, built in 1896 at Grangemouth, in England; she is 165 feet long, 26 ft. beam, and her depth of hold is 17.7 ft.; her gross tonnage is 542, and she was purchased from the Charlottetown Steam Navigation Company. *La Canadienne* was handed over to the hydrographic survey for survey work in the lower St. Lawrence.

'SHAMROCK.'

This vessel is employed in the buoy service between Montreal and Quebec. She is a steam barge 117 ft. long, 25 ft. beam, and 9 ft. 7 in, deep, with a gross tonnage of 237 tons. She is under the charge of Mr. U. P. Boucher, agent of the Department of Marine and Fisheries in Montreal.

'CURLEW.'

This is a twin screw iron steamer 116 ft. long, 19 ft. 8 in. wide, and 11 ft. 3 in. deep; gross tonnage, 158 tons. She is employed in fisheries work in the Bay of Fundy and western coasts of Nova Scotia, and is under the command of Acting Captain P. Robinson. She also assists in marine work when necessary.

'CONSTANCE.'

The *Constance* is a sister ship of the *Curlew* and is employed in revenue work in the River St. Lawrence and Atlantic coast. She is controlled entirely in regard to her movements by the Customs Department, but is managed in reference to expenditure, crew, &c., by this department. She is commanded by Captain May.

'LADY LAURIER.'

The *Lady Laurier* is a twin screw steel steamer, commanded by Captain Johnston. She is 214 ft. 9 in. long, 34 ft. 2 in. broad with a depth of 17 ft. 2 in., tonnage gross

1,051. She is employed in the lighthouse and buoy service on the Atlantic coast and is attached to the Nova Scotia Agency. She was built in 1902 to take the place of the late steamer *Newfield*. She is a very powerful and staunch steamer eminently fitted for the work she has to perform.—*Fitted with Marconi apparatus.*

'SCOUT' AND 'RESERVE.'

Are two steamers used in connection with the buoy service between Montreal and Kingston. The *Reserve* is used for sweeping the river and is also used for towing scows employed for the purposes of placing buoys in position. The *Scout* is furnished with electric light and a powerful searchlight. Her dimensions are 103 ft. 6 in. long, 25 ft. 6 in. beam, depth 9 ft. 2 in., gross tonnage 175.

'FALCON.'

The *Falcon* is a small steamer employed in the protection of the fisheries in British Columbia waters. She is 70 ft. 7 in. long, breadth, 17 ft. 8 in., depth, 7 ft. 4 in., with a gross tonnage of 71 tons. An account of her work will be found in Inspector Williams' report, in the fisheries part of the departmental report.

'KESTREL.'

The *Kestrel* is also employed in the protection of the fisheries in British Columbia waters. This vessel is 126 ft. long, 24 ft. beam, 12 ft. 2 in. depth, with a gross tonnage of 311 tons. She is a wooden vessel and commanded by Captain Newcomb. The conditions are so changed since this vessel was built, that she is now too slow, and it is recommended that a much faster and larger vessel be immediately built.

'CANADA.'

In reference to the five new steamers, the *Canada* is a twin screw small third class cruiser with a speed of 21¼ miles an hour. She was built by Vickers, Sons & Maxim, at Barrow in Furness, England, is armed with four 1½ pounder quick firing automatic mark 3, 1904 guns: two forward and two aft. Electrically lighted throughout and fitted with a very powerful searchlight. She arrived from England September, 1905, and has proved a very great success in the work for which she was designed to perform. It is the intention that this vessel should make a cruise of the West Indies during the winter. She carries a crew of 75 officers and men all told, and is fitted with the Marconi apparatus. Her dimensions are as follows:—200 ft. long, 25 ft. beam and 10 ft. 6 in. draft of water, with a gross tonnage of 850 tons. She is commanded by Captain Knowlton, and a number of the officers and crew have been through a course of instruction and received 1st class certificates in gunnery. This vessel is also armed in the way of small arms, with the new pattern Ross rifle, and the New Service D.A. Colt's revolvers. It was intended that this vessel should form the nucleus of the proposed Canadian Naval Militia.

'VIGILANT.'

The *Vigilant* is a steel twin screw, small 3rd class cruiser, built by the Polson Iron Works, Toronto. This vessel on her steam trial made a speed of 21½ miles an hour. She is 175 ft. long, 22 ft. beam, and draws 10 ft. of water. She is electrically lighted throughout and fitted with a powerful searchlight. She carries the same guns and the same small arms as the *Canada*, and is used for the protection of the fisheries on the great lakes in place of the *Petrel*. She is commanded by Captain Dunn. This vessel is the first of her class ever built in Canada, and is a credit in every way to the Polson firm of Toronto. She carries a crew of officers and men all told, of 53.

'MONTCALM.'

Is a screw steel ice-breaker, length over 252 ft., breadth outside 40·65 ft., depth bottom of keel to top of deck 19·05 ft., displacement 2,130 tons, two sets of triple expansion engines speed 13½ knots, with 4 Babcock & Wilcox water tube boilers, gross tonnage, 1,432 tons, indicated horse power 3,600, built by Messrs. Fleming & Ferguson, Paisley, Scotland. She is commanded by Captain Belanger.—*Fitted with Marconi Apparatus.*

'CHAMPLAIN.'

Is a single screw steel steamer. Length over all 132 ft., breadth outside 30 ft. 3 in., depth from top of deck to bottom of keel 11 ft. 3 in., displacement 550 tons, indicated horse power 850, her speed at trial 10½ knots, she is fitted with one simple compound, surface condensing engine, and one multitublar Scotch boiler. She is commanded by Captain McGough.

'LADY GREY.'

The department has had built this year a twin screw steel steamer for work in the St. Lawrence ship channel; she arrived from England late during thte past season, and was immediately put to work; she was built by Vickers Sons & Maxim of Barrow-in-Furness, England, and has proved a great success.

'ARCTIC.'

This vessel, after being overhauled and repaired, left for the northern waters of Canada on the 28th of July, 1906; it is the intention of the department that she should return some time next fall, and the attached reports that have already been received from Captain Bernier, the officer in charge, indicate that she is doing excellent work.

In addition to the above named vessels, there are four sea-going steam patrol launches, used on the Atlantic coast for the protection of the fisheries; and two on the River St. Lawrence and the Ottawa river, in connection with aids to navigation.

NUMBER OF OFFICERS AND MEN MANNING GOVERNMENT VESSELS.

The officers and crews of Government Steamers number 950 men all told approximately.

C.G.S. 'Arctic,' Albert Harbour, Pond's Inlet,
Baffin Land, September 29, 1906.

The Deputy Minister of Marine and Fisheries,
Ottawa.

Sir,—It affords me pleasure to advise you that the *Arctic* is safe and sound in Albert harbour, Pond's inlet, Northern Baffin Land, where we met the sloop *Albert*, and the whaler *Eclipse,* by whom we sent this letter.

After our departure from Father point we had a good deal of fortune; we were fortunate in the choice of the route through the middle pack, and we arrived first at Pond's inlet on August 19, 1906. We then proceeded north through Navy Board inlet, and took possession of all the Parry Archepelago islands.

Commencing by Bylot island, Griffiths, Cornwallis, Bathurst, Byam, Martin, Melville, Prince Patrick, Emerald, Eglington, Garrett, Davy, Young, Russell, and Lowther islands, on the southern point of which I planted the flag, and called Colonel Gourdeau point; also please find photo' of same, with the state of the ice before we reached Melville island, and that of the first bear that paid his respects to His Majesty's ship, the *Arctic,* Albert harbour, Pond's inlet, where we are quartered for the winter; and different photos' of other views along our route so far.

We expect to leave here the latter part of July, for North Lincoln and Jones sound, and return after seeing the whalers that we have missed, on account of their being caught in the icepack, off Melville bay, about June. There are four of them.

We will proceed along Baffin Land to Cumberland sound, and Port Burwell, where we expect to receive news from civilization, and, after the season is over, will return home.

I remain, sir,
Your humble servant,
J. E. BERNIER,
Commanding Officer.

HALIFAX DOCK YARD.

The Royal Naval Dock Yards at Halifax were taken over by the Department of Marine and Fisheries on January 1, 1907. It is the intention of the department to install the whole of the departmental staff in Nova Scotia in the yard, and the transfer is now taking place.

A full report on this dock yard will be made later on.

Attached is a special report from the officer commanding the C.G.S. *Montcalm,* in regard to the ice-work performed by this vessel in the River St. Lawrence during the past season.

I have the honour to be, sir,
Your obedient servant,
O. G. V. SPAIN,
Commander Marine Service of Canada.

REPORT OF THE WORK DONE BY C.G.S. 'MONTCALM,' FROM DECEMBER 3, 1905, UP TO MARCH 31, 1906.

December 3.—Received orders from Department of Marine and Fisheries to get ready to proceed down to Manicouagan, Martin river, and to cut the ice ahead of the ss. *Lake Michigan.* We took coal and supplies on board for Manicouagan point, part of the day. Weather cloudy with light rain.

December 4.—At 3 p.m., left King's wharf and proceeded to Louise basin, and went alongside of the *Lake Michigan,* in order to be ready at daylight. Weather cloudy and calm.

December 5.—At 6.30 a.m. left Louise basin with the ss. *Lake Michigan.* Weather cold and fine, strong W.S.W. wind, river covered with ice from 5 to 8 inches thick. Proceeded ahead of her to cut the ice. At 4.30 p.m. stopped off Green island to let the pilot of the *Lake Michigan* get off, and then continued on. Strong west wind, ice light here. At 7 p.m. Bicquette light abeam. Shaped course for Manicouagan and set log.

December 6.—At 8.45 a.m. anchored at English bay in 25 fathoms, light S.W. wind with light snow. We landed all supplies for Messrs. Dobell and Beckett. At 11.35 a.m. finished landing supplies and proceeded for Martin river. At 1.45 p.m. Point des Monts light abeam, shaped course S.E. by E. ¼ E., and set log. At 5.30 p.m. anchored at Martin river and took all working men on board. At 7.35 p.m., left Martin river and proceeded up. Light snow and calm.

December 7.—At 12.20 a.m., Matane light abeam, four miles off, light N.E. wind with light snow. At 3.25 a.m., Father point abeam. At 7.30 a.m., Green island light abeam, with thick snow and calm. Met thick ice from White island to Quebec. At 3.15 p.m. arrived at Quebec and came alongside Pointe à Carcy wharf. Weather fine and clear.

December 8.—Lying at Pointe à Carcy wharf. Awaiting high tide to go to Davie's dock to change blades. Weather cloudy and strong N.E. wind throughout.

December 9.—Lying at Pointe à Carcy wharf. Awaiting orders from Mr. Davie to go across to change our blades. Weather fine and clear, with strong N.E. wind throughout.

December 10.—Lying at Pointe à Carcy wharf. Light east wind, with thick snow throughout.

December 11.—At 4 p.m., left Pointe à Carcy wharf and proceeded to Lévis dock. Tried to get in, but could not, the water not having risen enough. Had to go back to Pointe à Carcy wharf at 6 p.m., and moored her for the night. Weather cold and river covered with ice.

December 12.—Lying at Pointe à Carcy wharf. Waiting for the high tide to get on the dock. N.E. wind, light, with light snow. River covered with ice.

December 13.—At 7 a.m. left Pointe à Carcy wharf and proceeded across to Davie's dock, and got in all right. Light E.E.E. wind, with light snow throughout. At low tide Mr. Davie started to work to take off the blades. River full of ice.

December 14.—Lying at Mr. Davie's dock, working at every low tide changing blades. Weather fine and clear and cold, with light N.W. wind.

December 15.—Lying at Mr. Davie's dock and still working at the blades. Finished putting blades on at noon. At 8 p.m., at high water, left Mr. Davie's dock and came across to Pointe à Carcy wharf. Weather fine and cold throughout with northerly wind.

December 16.—Lying at Pointe à Carcy wharf. S.W. wind and weather fine. River covered with ice. At noon received orders to proceed up the river to pick up a buoy reported adrift in the ice. At 1.30 p.m., proceeded up as far as St. Nicholas, but could not see the buoy reported adrift. At 4 p.m., came back alongside Pointe à Carcy wharf.

December 17.—Lying at Pointe à Carcy wharf all day. Weather fine and calm throughout.

December 18.—At 10.35 a.m., left and proceeded up the river looking for a buoy reported adrift. Went as far as St. Nicholas, where we found the buoy adrift; we picked it up and proceeded down. At 12.30 p.m. came alongside of Kings wharf, and landed the buoy on the wharf, and then proceeded to Pointe à Carcy wharf. Light S.W. wind and weather fine throughout. Ice drifting down the river freely.

December 19.—Lying at Pointe à Carcy wharf taking coal all day. Light E.N.E. wind, and weather fine. Ice in the river running down freely.

December 20.—Lying at Pointe à Carcy wharf all day. Weather fine and calm. Thick ice in the river.

December 21.—Lying at Pointe à Carcy wharf, with strong easterly winds and snow. At 3 p.m. a blinding snow storm with gales from N.E. High water at 1.40 p.m., and at 3 p.m. current still running down, proceeded up as far as the bridge, found the river covered with heavy ice and batture ice. Making fast, had great difficulty turning the ship towards Quebec. Arrived at Pointe à Carcy wharf at 5 p.m. Still blowing a gale, with blinding snow.

December 22.—At 7 a.m., left Pointe à Carcy wharf and proceeded up the river as far as St. Nicholas. Strong S.E. wind, with heavy snow, river covered with ice, but running down freely. At 9.45 a.m. came alongside Pointe à Carcy wharf.

December 23.—Lying at Pointe à Carcy wharf all day. Light westerly wind, and weather fine throughout. Ice running down the river freely.

December 24.—Left Pointe à Carcy wharf at 8 p.m., and proceeded up to Cape Rouge. River covered with ice, the batture ice getting larger opposite Fairchild's point up as far as Point Confederation. Ice running down freely. At 9.40 a.m. came alongside Pointe à Carcy wharf.

December 25.—Lying at Pointe à Carcy wharf all day. Light S.W. wind, and weather fine. First part fine, and light snow during latter part. The officers and quarter-masters received instructions, while at the wharf, to pay great attention to the rising of the tide and the running down of the ice.

December 26.—At 10.50 a.m., left and proceeded with ebb tide, meeting a great quantity of ice, but nothing heavy. Ship going ahead full speed as far as St. Nicholas wharf, but a heavy snow squall made us stop going ahead and forced us to keep her in the middle of the channel. At 12.20 p.m., put back for Quebec. Light S.W., with snow. At 2 p.m., came alongside Pointe à Carcy wharf.

December 27.—Lying at Pointe à Carcy wharf all day. Light S.W. wind, and weather fine throughout. Light ice on the river to-day.

December 28.—Lying at Pointe à Carcy wharf all day. Weather very fine and very mild. Crew employed washing ship. Light ice running in the river.

December 29.—At 12.55 p.m., left and proceeded up the river with strong N.E. wind, with thick snow. At 2 p.m. turned back at Point Confederation, at 2.50 p.m. came alongside Pointe à Carcy wharf. Ice light and running down freely.

December 30.—Lying at Pointe à Carcy wharf all day. Light N.E. wind, with light snow, and weather very mild.

December 31.—Lying at Pointe à Carcy wharf all day. Light W.S.W. wind and weather cloudy and mild. Ice light in the river.

January 1.—Lying at Pointe à Carcy all day. Weather fine and calm throughout. Ice in the river very light.

January 2.—At 1 p.m., left Pointe à Carcy and proceeded up the river as far as Pointe aux Trembles. River covered with ice, but nothing heavy. At 4.45 p.m., came alongside the Pointe à Carcy wharf. Weather fine and cold, with light N.W. wind.

January 3.—At 1.35 p.m., left the Pointe à Carcy wharf and proceeded up the river as far as Point Confederation: river covered with ice, but nothing heavy—about 6 to 8 inches in thickness—and running down freely. At 3.20 p.m. came back to the Pointe à Carcy wharf. Weather fine and cool, with light W. wind.

January 4.—At 7.35 a.m., left the Pointe à Carcy wharf and proceeded up the river as far as St. Nicholas. Ice very heavy opposite Cape Rouge. At 9.35 came alongside Pointe à Carcy wharf. Strong N.E. wind, with heavy snow storm. At 3.40 p.m., proceeded up the river again. Blinding snow storm, with easterly gale. Went up as far as the Quebec bridge. Ice running slowly on account of this heavy wind. At 5.55 p.m., came back alongside the Pointe à Carcy wharf for the night.

January 5.—At 7 a.m., left Pointe à Carcy and proceeded up the river as far as Cape Rouge bay. Heavy packed ice formed in the bridge up as far as Cape Rouge, but we cut it through up and down the river. At 10 a.m. came back alongside Pointe à Carcy wharf. Light S.W. wind, weather fine and cold.

January 6.—At 7 a.m., left Pointe à Carcy and proceeded up the river. Weather fine, with light west wind. At 8 a.m., turned back off Point Confederation. At 8.30 a.m., came alongside Pointe à Carcy wharf. Light scattered ice running down freely.

January 7.—At 7 a.m., left Pointe à Carcy and proceeded up the river. Light N.W. wind, weather fine and cold. At 8 a.m., turned around opposite Cape Rouge bay and proceeded down the river covered with ice, but nothing heavy. At 8.55 a.m. came alongside Pointe à Carcy wharf.

January 8.—At 8 a.m., left Pointe à Carcy and proceeded up the river as far as St. Nicholas wharf. River covered with heavy ice from the bridge to Confederation point. We cut it through and let it run down freely. At 10 a.m., came alongside Pointe à Carcy wharf. At 2 p.m., left the wharf and proceeded out to look for one of the gas buoys adrift; we picked up the buoy and laid it on the King's wharf, then returned to Pointe à Carcy wharf.

January 9.—At 9 a.m., left Pointe à Carcy and proceeded up the river. Weather very cold and vapour rising from the water. Went as far as Cape Rouge, at 10.25 a.m. turned back, ice heavy and packed from the bridge up to Confederation point. The 'jam' was solid; we cut through it until it broke away. At 11 a.m. it started running down. Came back alongside the Pointe à Carcy wharf.

January 10.—At 9 a.m. left Pointe à Carcy wharf and proceeded up the river as far as Confederation point. River covered with ice, but not very heavy. At 11.25 a.m. we cut the ice at the Beauport 'batture,' to keep the channel open. At 12.15

a.m. came back alongside the Pointe à Carcy wharf. Light N.W. wind, weather fine and cold.

January 11.—At 9.35 a.m. left Pointe à Carcy and proceeded up the river. Light S.W. wind, cloudy and mild weather. At 10.40 a.m. turned back to go down to Pointe à Carcy. River covered with heavy ice from the Quebec bridge to Cape Rouge, but it was running down freely. At 11.45 a.m. arrived at berth at Pointe à Carcy wharf.

January 12.—At 10 a.m. left Pointe à Carcy wharf, steamed up the river. Fresh N.W. wind with snow. Turned back opposite Cape Rouge at 11.05. Ice heavy, but running down freely. Put the ship in her berth at 11.35 a.m., at Pointe à Carcy.

January 13.—Lying at Pointe à Carcy wharf all day. Light W.S.W. wind. Weather fine and mild throughout the day. Ice running down the river freely.

January 14.—Lying at Pointe à Carcy wharf all day. Strong N.E. wind and cloudy weather.

January 15.—Left the Pointe à Carcy wharf at 11.30 a.m., and steamed up the river. Strong N.E. wind, weather cloudy. River covered with heavy packed ice for about one-half of a mile from the Quebec bridge up. The ship stopped several times in this 'jam,' but after some work we managed to cut through, and it started running down at 1 p.m. Went up as far as the Confederarion point, and came back to the Pointe à Carcy wharf at 2 p.m.

January 16.—At 1 p.m. left from Pointe à Carcy wharf and went up the river as far as Cape Rouge bay. River covered with ice, but running down freely. At 2.55 p.m. came alongside the Pointe à Carcy wharf.

January 17.—At 1.30 p.m. left from Pointe à Carcy and proceeded up the river, fresh W.S.W. wind and weather fine; found the ice stopped from Quebec bridge up to Cape Rouge; very heavy jam. We cut through about a half-mile and the ship stuck fast and would not go astern. We tried to back her until dark, and then we stopped the engines and transported coal from the fore-hold to the after bunkers. At 11.50 p.m. she backed off the jam with difficulty. The ice in the jam was from 10 to 15 feet thick. We had to work for twelve hours at it before ship could be freed and the jam started. At midnight, working the ship with the jam the best I could astern and ahead until we were down off the piers of the Quebec bridge, from there I managed to turn the ship and work my way down to Pointe à Carcy.

January 18.—At 1.10 a.m. came alongside Pointe à Carcy wharf. Light west wind, weather fine. Waiting for daylight to go back in the jam. At 7.30 a.m., light N.E. wind, with thick snow. At 1.50 p.m., left Pointe à Carcy and proceeded up the river. Fresh N.E. wind with thick snow. Went up to Cape Rouge bay. Ice heavy and packed, but running down freely. At 4.25 p.m. came back alongside the Pointe à Carcy wharf.

January 19.—At 7.30 a.m. left Pointe à Carcy and proceeded down the river, for the ss. *Bavarian*, with a party of inspectors and others. Light west wind; weather fine and cold. At 10.30 a.m. came alongside the ss. *Bavarian* and landed the passengers on board. At 1.15 left the ss. *Bavarian* and proceeded up the river. At 3.45 p.m. came alongside the King's wharf, and landed the party and proceeded up as far as Cape Rouge. Came alongside the Pointe à Carcy wharf at 5.20 p.m., in very heavy ice. Ice very heavy also as far as Cap Rouge, but it is running down freely.

January 20.—At 4 p.m. left Pointe à Carcy and proceeded up the river in a heavy snow storm. Went up to the Quebec bridge. River covered with ice, but running freely. Strong N.E. wind with snow. Came back to the Pointe à Carcy wharf at 5.35 p.m.

January 21.—Lying at Pointe à Carcy wharf all day. Light E.N.E. wind, with rain. Ice running down the river freely.

January 22.—At 7 a.m. left Pointe à Carcy and proceeded up the river. Light east wind and weather very mild. Steamed up to Cape Rouge. Ice running down freely. Went to cut some ice for Mr. E. Dussault, at the head of his wharf under construction. At 10.15 a.m. arrived back at Pointe à Carcy wharf.

January 23.—Lying at Pointe à Carcy wharf all day. Received orders to have the ship ready to go to Seven islands, to take coal and provisions on board. Light east wind. Weather thick. Thick ice running down the river.

January 24.—Lying at Pointe à Carcy wharf all day. Still taking coal on board. Weather fine and calm. Ice running down freely in the river.

January 25.—Lying at Pointe à Carcy wharf all day. Ship ready for trip down to Seven islands, waiting for orders to go. Light E.N.E. wind, with light snow.

January 26.—At 7 a.m. left Pointe à Carcy and proceeded for Seven islands, with gentlemen, mail and medicine supply on board. Light S.W. wind, weather cloudy. River covered with ice. At 9.25 Crane island light abeam. Ice very heavy. At 5.40 p.m. Picquet light abeam, three miles off. Changed course E. by N. and could not set log on account of ice. Ice very heavy from Quebec to Bic. Ice from Bic down to Seven islands not quite so heavy. At midnight off Pointe des Monts, about six miles off, same weather.

January 27.—At 12.30 a.m. changed course N.E. by E. ½ E. Fresh S.W. wind, and weather cloudy. At 2 a.m. thick snow. At 3.40 a.m. stopped off Seven islands, waiting for daylight. Strong S.W. wind, and thick snow. Cast the lead 130 fathoms deep. At 7 a.m. weather got clear, proceeded into the bay. Ice from the out island into the bay is from 20 to 24 inches thick. At 10 a.m. stopped inside Sandy point, and landed all supplies. At 2 p.m. left Seven islands bay and proceeded out. Strong W.S.W. wind. At 2.45 p.m. ship one mile off Carousel island. S.W. by W. ¼ W. Light ice. At 7.20 p.m. Pointe des Monts abeam, six miles off. Changed course W. by S. ¾ S. At midnight off Father oint. Light S.W. wind, and weather very thick. Light ice running slowly.

January 28.—At 2.10 a.m. anchored three miles east of Bicquet in 18 fathoms of water. Light S.W. wind, and weather very thick. Waiting for daylight. At 6.30 a.m. proceeded up. Light S.W. wind and smoky weather. At 1 p.m. Kamouraska light abeam. At 4.10 p.m. Crane island light abeam. At 6.25 p.m. arrived at Quebec and came alongside Pointe à Carcy wharf. Light N.W. wind, and weather fine.

January 29.—At 11 a.m. left Pointe à Carcy wharf and proceeded up the river as far as Cape Rouge. Light westerly wind and weather very cold, and thick vapour rising from the river. At 1 p.m. came back alongside of Pointe à Carcy wharf. Ice running down freely.

January 30.—At 11.55 left Pointe à Carcy wharf and proceeded up the river as far as Cape Rouge. River covered with ice running down freely. At 1.25 p.m. came back alongside Pointe à Carcy wharf.

January 31.—Lying at Pointe à Carcy wharf all day. Light east wind, with light snow throughout, and weather very mild.

February 1, 1906.—At 1.10 p.m. left Pointe à Carcy wharf and proceeded up the river with the Marine Engineers' Association of Canada on board. At 2.40 p.m. turned off St. Nicholas and came down the river as far as St. Joseph de Lévis. At 4 p.m. came alongside Pointe à Carcy wharf. Light east wind, weather mild and cloudy. Landed all engineers.

February 2.—Lying at Pointe à Carcy wharf, weather very cold, vapour rising from the river very thick, ice running down freely.

February 3.—At 1 p.m. left Pointe à Carcy wharf and proceeded to Mr. E. Dussault's wharf to cut the ice at the end of the wharf as far inside as possible for the safety of the ship, and also proceeded up the river and found that the ice from the bridge up to Cap Rouge was stopped, we cut it up and down twice, and the last time the ice started to run down freely; it was very heavy. At 4 p.m. came back alongside Pointe à Carcy wharf. Light N.N.W. wind, weather very cold and vapour rising from the river very thick.

February 4.—Lying at Pointe à Carcy wharf all day. Light N.E. wind, with snow throughout and weather mild.

February 5.—At 7.20 a.m. left Pointe à Carcy wharf and proceeded up the river. Light N.W. wind. Weather fine and cold. Went up as far as Point Confederation.

At 10 a.m. came back alongside Pointe à Carcy wharf; from the bridge up to Cap Rouge ice very heavy, but running down freely.

February 6.—At 7 a.m. left Pointe à Carcy wharf and proceeded up the river. Light N.W. wind, weather very cold. Went up as far as Point Confederation. At 9 a.m. came back alongside Pointe à Carcy wharf. Vapour rising from the river very thick. River covered with light ice running down freely.

February 7.—At 7 a.m. left Pointe à Carcy wharf and proceeded up the river as far as St. Nicholas wharf. Ice running down freely, weather very cold, fresh N.W. wind. Vapour rising from the river very thick. At 9.30 p.m. came back alongside Pointe à Carcy wharf.

February 8.—At 8 a.m. left Pointe à Carcy and proceeded up the river. We found ice stopped from Sillery pointe up to Cap Rouge; went up and down through it twice, as far as Point Confederation, with difficulty, but the ice started running down freely. Also went to cut the ice at Mr. Dussault's wharf, and large piece off Beauport batture ice. At 1 p.m. came back alongside Pointe à Carcy wharf. Fresh easterly wind, weather cloudy.

February 9.—Left Pointe à Carcy at 9.30 a.m. and proceeded up the river. N.E. wind, with snow. Went as far as Point Confederation. River covered with heavy ice, but running freely, and also was down to Mr. Dussault's wharf at 11.30 a.m. Came back alongside Pointe à Carcy wharf with snow at 2 p.m. Heavy snow storm, with gale of E.N.E. wind.

February 10.—Left Pointe à Carcy at 8.45 a.m. and proceeded up the river as far as St. Nicholas. River covered with heavy ice, and met a large field of batture ice, cut through it and let the ice run down freely. At 12.10 p.m. came back alongside Pointe à Carcy wharf. Light S.W. wind, weather fine.

February 11.—Left Pointe à Carcy at 8 a.m. and proceeded down to cut the ice off Mr. Dussault's wharf. Working two hours; cut about 100 feet inside the end of his wharf, which was as far as we could go with the ship on account of the depth of the water. Also proceeded up the river as far as Cap Rouge; ice heavy, but running down freely. At 11.40 a.m. came back alongside Pointe à Carcy wharf. Weather fine and calm throughout.

February 12.—At 8.30 a.m. left Pointe à Carcy and proceeded down to Mr. Dussault's wharf and cleared away all the ice we had cut yesterday, about 100 feet inside the end of the wharf. Weather fine, with light S.W. wind. At 9.30 a.m. came back alongside Pointe à Carcy wharf.

February 13.—At 8.30 a.m. left Pointe à Carcy to proceed down to Mr. Dussault's wharf, and we cut the ice a little farther inside than yesterday; worked at it two hours, and came back alongside Pointe à Carcy wharf at 10.30 a.m. Light S.W. wind, weather fine. Ice running down in the river freely.

February 14.—At 1.45 p.m. left Pointe à Carcy and proceeded up the river as far as the bridge; river covered with ice and running down slowly. Strong easterly wind, with blinding snow storm. At 3 p.m. came back alongside Pointe à Carcy wharf, the storm still raging.

February 15.—At 1.45 p.m. left Pointe à Carcy and proceeded up the river as far as Cap Rouge. Strong easterly wind, with heavy snow. River covered with heavy ice, but running down freely. At 3.15 p.m. came back alongside Pointe à Carcy wharf with difficulty on account of thick snow. Weather fine and clear at 4.30 p.m.

February 16.—At 1.35 p.m. left Pointe à Carcy and proceeded up the river. Light N.W. wind, weather fine and cold. Turned off Cap Rouge bay. River covered with heavy thick ice running down freely, and also cut a large piece off Beauport batture. At 4.45 p.m. came back alongside Pointe à Carcy wharf.

February 17.—At 1.30 p.m. left Pointe à Carcy and proceeded down to Mr. Dussault's wharf. Broke up all new ice and some of the old, and got inside as much as we could. Saw sand and mud rising to the surface of the water. Worked about two hours. Also proceeded up the river as far as Cap Rouge; ice very heavy, but running

freely down. At 4.30 p.m. came back alongside Pointe à Carcy wharf. Light N.W. wind, and weather very fine.

February 18.—Lying at Pointe à Carcy wharf all day. Light N.E. wind; weather fine and mild. Ice running down freely.

February 19.—Lying at Pointe à Carcy wharf all day. Weather fine and mild. Very little ice on the river to-day.

February 20.—At 6.30 a.m. left Pointe à Carcy wharf and proceeded up the river as far as Point Confederation. Light ice on the river. Weather cloudy and thick snow. At 8.30 a.m. came back to Pointe à Carcy wharf.

February 21.—Lying at Pointe à Carcy wharf all day, took coal. Weather calm, with light rain throughout.

February 22.—Lying at Pointe à Carcy wharf all day. Light N.W. wind. Weather very fine throughout. Crew employed painting outside of ship.

February 23.—At 6.30 a.m. left Pointe à Carcy and proceeded out. Light N.E. wind, and weather very fine. Working cutting ice at end of Mr. Dussault's wharf for about one hour, and also up the river as far as Cap Rouge bay. Met only light scattered ice running down freely. At 9.25 a.m. came alongside Pointe à Carcy wharf. Crew employed painting ship.

February 24.—Lying at Pointe à Carcy wharf all day. Weather fine, mild and calm throughout. Crew employed painting and cleaning ship.

February 25.—Lying at Pointe à Carcy wharf all day. Weather cloudy and calm. Very little ice on river to-day. At 7 p.m. heavy rain.

February 26.—Lying at Pointe à Carcy wharf all day. Light easterly, with thick snow. Light ice on river to-day.

February 27.—Lying at Pointe à Carcy wharf all day. Light S.W. wind. Weather very mild. Light ice on river. Crew very usefully employed.

February 28.—At 9 a.m. left Pointe à Carcy wharf and proceeded down to Mr. Dussault's wharf. Worked one hour cutting ice at end of wharf as far inside as possible for safety of ship. also went up the river and found a large piece of batture ice jammed from the bridge up for about two miles, very heavy, from two to three feet thick; took four hours to cut it through. At 2.30 p.m. ice started to run down freely. Fresh N.W. wind. Weather fine and cold throughout. At 3 p.m. came back alongside Pointe à Carcy wharf.

March 1.—At 11 a.m. left Pointe à Carcy and proceeded up the river. Fresh west wind, and weather very fine but cold. At 12.45 p.m. turned off Point Confederation; river covered with ice, but nothing heavy, and running down freely. At 1.40 p.m. came back alongside Pointe à Carcy wharf.

March 2.—Lying at Pointe à Carcy wharf all day. Light S.W. wind and weather fine. Crew employed for painting.

March 3.—Left Pointe à Carcy at 12.20 p.m., and proceeded down to cut the ice at the end of Mr. Dussault's wharf; worked at it one hour, also proceeded up the river as far as Cap Rouge bay. River covered with ice, but running down freely. Fresh east wind, with thick snow. At 2.25 p.m. came alongside Pointe à Carcy wharf, same weather.

March 4.—Lying at Pointe à Carcy wharf all day. Fresh N.E. wind, with heavy snow storm. At noon light snow; ice running freely.

March 5.—Left Pointe à Carcy at 2 p.m. and proceeded down to cut the ice at the end of Mr. Dussault's wharf. We worked at it one hour, and also proceeded up the river as far as Cap Rouge bay. River covered with ice, but running freely. Light northerly wind. Weather fine and clear. Came back to Pointe à Carcy wharf at 4.30 p.m.

March 6.—Lying at Pointe à Carcy wharf all day. Light west wind and weather fine throughout. Crew employed painting ship. Light ice running down the river.

March 7.—Lying at Pointe à Carcy wharf all day. Light west wind. Weather fine and mild throughout. Crew employed cleaning and painting ship. Light ice running down the river.

March 8.—Left Pointe à Carcy wharf at 2.30 p.m., with Civil and Mining Engineers' Association party on board, sent by J. U. Gregory, Esq., and proceeded up the river as far as Point aux Trembles. Light ice in the river. Weather fine and mild. Came alongside Pointe à Carcy at 4.50 and landed all the party; same weather.

March 9.—Lying at Pointe à Carcy wharf all day. Weather cloudy and calm throughout. Crew employed cleaning ship.

March 10.—Left Pointe à Carcy wharf at 6 a.m., and proceeded down to cut the ice at the end of Mr. Dussault's wharf; we worked at it one hour, and also proceeded up the river as far as bridge. Light ice running down freely. S.W. wind, weather fine and very mild throughout. Came alongside Pointe à Carcy wharf at 8 a.m.

March 11.—Lying at Pointe à Carcy all day. Strong S.W. wind and weather fine. At noon large piece of batture ice running down freely.

March 12.—Lying at Pointe à Carcy wharf all day. Light S.W. wind and weather fine. Light ice running on the river. Crew variously employed.

March 13.—Left Pointe à Carcy at 9.15 a.m. and proceeded up the river as far as Point Confederation. Light N.W. wind. Weather fine and cold. Came alongside Pointe à Carcy wharf at 11.30 a.m. Light ice running down freely.

March 14.—Lying at Pointe à Carcy wharf all day. Fresh N.W. wind. Weather fine and very cold throughout. Light scattered ice running down the river. Crew employed variously.

March 15.—Left Pointe à Carcy at 9.30 and proceeded down to Mr. Dussault's wharf to cut the ice. We worked at it for one hour and also proceeded up the river as far as Point Confederation. River covered with ice, but nothing heavy, and running down freely. Came alongside Pointe à Carcy at noon. Weather fine and calm throughout.

March 16.—Lying at Pointe à Carcy wharf all day. Light S.W. wind, and weather fine throughout; light ice running down the river. Crew employed variously.

March 17.—Left Pointe à Carcy at 1 p.m., and proceeded up the river as far as Cap Rouge. River covered with new ice, but nothing heavy, and also proceeded down to cut the ice at Mr. Dussault's wharf. Fresh S.W. wind, and weather very fine throughout. Came alongside Pointe à Carcy wharf at 3.20 p.m.

March 18.—Lying at Pointe à Carcy wharf all day. Light N.W. wind. Weather fine and very could throughout.

March 19.—Lying at Pointe à Carcy wharf all day. Weather fine and clear. Wind variable throughout.

March 20.—Lying at Pointe à Carcy all day. Received order to get ready for Seven Islands trip, taking coal and provisions and also supplying with medecines, &c., &c. Strong easterly wind, with heavy snow throughout. Ship ready for sea at 5.30 p.m.

March 21.—Left Pointe à Carcy at 7 a.m., and proceeded down the river for Seven Islands, with Mr. Scott, Judge Simard, Dr. Beaumier, Mr. Cinq-Mars to represent *La Presse,* Mr. Sirois, of the *Soleil,* and Mr. Prince, for *La Patrie,* and also four policemen. Light S.W. wind, and weather cloudy. Heavy ice from Bellechasse island down to the lower pier of the Traverse at 10.40 a.m. Strong S.W. wind, light scattered ice as far as Cap au Saumon, but from there down to Bic no ice. Bicquette at 4.40 p.m. abeam. Shaped course for Pointe des Monts, met heavy ice off Father Point and cut it through as far as Godbout river, at Pointe des Monts lighthouse 10.40 p.m. abeam. Shaped course for Seven Islands. Light S.E. wind, and weather cloudy; light ice. Off Egg island at midnight.

March 22.—At 2.45 a.m. stopped off Seven Islands, and waiting for daylight. At 5.25 a.m. got under way, and at 6.30 a.m. stopped off Seven Islands village in the ice from 2 feet thick, and landed Mr. Scott, Judge Simard and Dr. Beaumier, also landing all supplies and giving order not to let anyone on board from the shore, and not allowing any of the crew to go ashore on account of contagious diseases. 2 p.m., blowing a heavy gale from S.E., with thick snow. Lying in the bay of Seven Islands, hard and fast in the ice, waiting on those gentlemen. At 10 p.m. wind shifted to W.S.W., with the same velocity, and the ice in the bay beginning to break off. Had to drop anchor.

March 23.—Lying in the bay of Seven Islands waiting for Judge Simard, Mr. Scott and all the other gentlemen. Strong N.W. wind. Weather fine and very cold, At 4.30 p.m. Judge Simard came on board. Had to wait here for the other gentlemen. Held for the night.

March 24.—At 2 p.m. all these gentlemen arrived on board. At 3 p.m. left Seven Islands and proceeded out. Light N.N.W. wind. Weather fine, but very cold. At 8 p.m. stopped off Pointe des Monts and landed the mail for Godbout. At 8.50 p.m. proceeded on our way up. At midnight off Metis. Ice very light.

March 25.—At 2.40 a.m. Bicquette abeam. Fresh N.W. wind and weather fine. At 4 a.m. slowed down off Basque island to wait for daylight. At 5.20 a.m. Green Island light abeam. Full speed. Met very heavy ice from White island up to Quebec. At 3.40 p.m. arrived at Quebec and came alongside of Pointe à Carcy wharf and landed all these gentlemen.

March 26.—Lying at Pointe à Carcy all day. Weather cloudy and calm. Ice in the river running down freely. Taking coal on board.

March 27.—At 8.15 a.m. left Pointe à Carcy wharf and proceeded down to cut the ice at Mr. Dussault's wharf, and a large piece of batture ice; working at it for one hour; also proceeded up the river as far as the Quebec bridge. Ice light, and running down freely. At 10.30 a.m. came alongside Pointe à Carcy wharf. Light S.E. wind and heavy rain and thick weather.

March 28.—Lying at Pointe à Carcy wharf all day, weather very fine and mild throughout; taking coal, crew employed painting ship.

March 29.—Lying at Pointe à Carcy wharf all day, light S.W. wind and weather fine and mild throughout, light ice running down the river, still taking coal.

March 30.—Lying at Pointe à Carcy wharf all day, weather fine, calm and very mild throughout, very light ice in the river, crew employed painting and scraping woodwork.

March 31.—Lying at Pointe à Carcy wharf all day; west wind, weather very fine, crew employed in painting, very little ice in river.

During these four months, distance running through ice was 2,987 miles.

I am, sir, your obedient servant,

CHARLES KOENIG,

Captain Canadian Government Steamer 'Montcalm.'

APPENDIX No. 14.

INVESTIGATIONS INTO WRECKS.

OTTAWA, CANADA, January 12 1907.

To the Deputy Minister of Marine and Fisheries,
Ottawa.

SIR,—I have the honour to submit my report upon the casualties and accidents that have occurred upon the coasts of Canada, and the Great Lakes, during the past season of navigation.

Investigations were held on the following vessels:—

Agnar-Monmouth, stranding of *Agnar* SS.; *Agnar-Thor,* collision; *Angola,* stranding; *Aranmore-Alexander Rudolph,* collision; *Clarisse,* stranding; *Elina,* stranding; *Etolia,* stranding; *Gaspesian-Elevator No. 7,* collision; *Golspie,* stranding; *Havanna,* collision; *Hazelton,* collision; *Hestia,* stranding; *Islander,* foundering; *Kensington,* stranding; *Mount Royal,* collision; *Mystic,* stranding; *Ottawa-Maude,* collision; *Pomeranian,* striking Father Point wharf; *Princess,* foundering; *Rembrandt,* foundering; *Resolute,* foundering; *Valencia,* stranding; *Victoria,* stranding.

The evidence and judgment in each of the above cases are on file in the Department.

The above list comprises all casualties of importance, which occurred during the past season, especially where loss of life ensued. My instructions are to investigate, as far as possible, but, it is out of the question that every casuality can be investigated as, owing to the fact that the department has very often to rely on the press for information with regard to shipping disasters; it, therefore, often is the case that accidents occur to vessels, and the facts do not become known to the department in sufficient time for an investigation to be carried on. If owners of vessels, and agents, would notify the department directly accidents occur, it would be of great benefit all round.

The St. Lawrence route has been singularly clear from accidents during the past season, none of any importance having occurred, with the exception of the *Mystic,* which went ashore on Crane island in July.

The total value of the trade of the St. Lawrence route for the fiscal year ending June 30, 1906, was $151,571,214, an increase of $30,637,660 over the year 1905.

The Shipping Casualties' Act has lately been amended, and the following changes have been made:—

1. A wreck commissioner has been appointed to hold investigations in all parts of the Dominion.

2. A statement of the case need not be issued as heretofore, before the commencement of the proceedings, where a certificate is to be dealt with; the defendant's certificate may be cancelled or suspended, after he has been furnished with a copy of a statement of the case, and had an opportunity of making a defence.

3. An investigation may be held into the stranding of any vessel, whether damaged or not.

4. Two assessors have been appointed, one each, for the ports of Montreal and Quebec; Captain Archibald Reid and Captain John Temple. These officers have been appointed for a term of three years.

A full statement of wrecks and casualties that have occurred during the twelve months ending June 30, 1905, in Canadian waters and to Canadian sea-going vessels in other waters, will be found in the supplement of this report.

I have the honour to be, sir,
Your obedient servant,
O. G. V. SPAIN,
Wreck Commissioner.

APPENDIX No. 15.

RECORD of Live Stock Shipped from Port of Montreal for the Fiscal Year 1905-6.

No.	Date.	Sheep.	Cattle.	Horses.	Hay for Feed.	Grain for Feed.	Number Men.
					Lbs.	Lbs.	
171	July 1, 1905, to Nov. 30, 1905.....	15,188	91,366	530	27,629,910	5,997,908	3,706
66	May 1, 1906, to June 30, 1906.....	3,889	35,505	38	9,688,050	2,970,730	1,391
237	Total for the year ending June 30.....	19,077	126,871	568	37,317,960	8,968,638	5,097

	Sheep.	Cattle.	Horses.
Total for the year 1904–5.....	49,422	108,553	279
" 1903–4.....	57,741	133,594	361
" 1902–3.....	44,330	101,508	456
" 1901–2.....	46,350	71,639	1,089

† 19,833 United States cattle.

H. DELORME,
JAS. O'GRADY,
Inspectors.

RECORD of Live Stock Shipped from Port of Saint John, N.B., during Season of 1905 and 1906.

Date.	Sheep.		Cattle.				Horses.	Hay for Feed.	Grain for Feed.	Number Men.
	Shipped.	Lost.	Fat.	Stokers.	Total.	Fat.	Shipped.			
Dec. 1905....	875	7	6,159	149	6,308	25	21	1,867,970	611,100	256
Jan. 1906....	597	14	7,916	84	8,000	13	16	2,270,045	674,800	316
Feb. 1906....	279	8	5,909	127	6,036	13	12	1,800,800	559,650	233
Mar. 1906....	60	.....	5,519	60	5,579	23	16	1,631,565	538,300	212
April 1906....	2,160	3	7,500	120	7,620	18	14	1,949,360	660,800	301
	3,971	32	33,003	540	33,543	92	79	9,519,740	3,044,650	1,318

F. J. HARDING.

RECORD of Live Stock Shipped from Port of Halifax, N.S., during the Fiscal Year 1905-6.

No.	Date.	Steamer.	Destination.	Cattle.		Hay for Feed.	Grain for Feed.	Number Men.
				Fat.	Total.			
1	Jan. 15..	Pretorian .	Liverpool.....	102	102	24,800	8,200	4
2	Feb. 13..	Salacia....	Liverpool and Glasgow.....	377	377	102,000	31,500	15
3	Mar. 27..	Salacia....	Liverpool and Glasgow.....	563	563	139,500	44,600	22
			Total for the year 1906....	1,042	†1,042	266,300	84,300	41

†'202 were United States Cattle.

APPENDIX No. 16.

STATEMENT giving Names and Stations of Light-keepers, &c., in the Dominion.

ABOVE MONTREAL.

Name.	Station.	Appointed.	Salary.
			$ cts.
Armstrong, John	Kaministikwia River	April 28, 1894	300 00
Alexander, Andrew	Lamb Island	" 26, 1897	500 00
Armstrong, Robt	Richards Landing	June 23, 1904	40 00
Barnes, Isaac	Gravenhurst	Mar. 20, 1906	100 00
Baechler, F	South River	July 2, 1903	80 00
Baker, Henry F	Clapperton Island	Dec. 2, 1895	350 00
Boyd, Robert P	Cole Shoal	April 9, 1884	250 00
Boyd, Wm. S	Griffith Island	May 14, 1889	400 00
Butler, Silas L	Port Dover	July 15, 1897	300 00
Baxter, Wm. L	Brebœuf Range	Nov. 23, 1885	400 00
Boucher, Francois	Aylmer Island	" 17, 1882	175 00
Bamford, Robert	Bamford Island	June 21, 1888	250 00
Bertrand, Félix	Coulonge Lake	April 2, 1892	100 00
Boyd, Wm. M	Kagawong	" 13, 1893	72 00
Boyter, A. B	Narrow Island	Jan. 3, 1898	250 00
Boyter, David	Little Current lights	April 22, 1902	350 00
Brown, James	Southampton Harbour	June 29, 1904	150 00
Ball, J. H	Mississagi Strait, Light and Fog Alarm	May 7, 1900	750 00
Black, W. H	Kingsville Range	July 27, 1902	150 00
Borron, Mrs. E. B	French river Range	Jan. 30, 1903	500 00
Burmister, John F	Nottawasaga Island	May 2, 1904	500 00
Brophy, J. J	Brown or Knapp Point	" 9 1905	180 00
Claude, Benj	Dorval	Sept. 7 1872	300 00
Collins, Allen	Christian Island	Mar. 25, 1891	*425 00
Cross, Manly R	Gananoque Narrows and Jack Straw Shoal Light	Aug. 25, 1896	550 00
Campbell, Robert	Goderich	June 9, 1886	400 00
Craig, Wm	Thunder Cape Light and Fog Alarm	May 17, 1892	700 00
Cook, Sheldon B	Long Point Light and Fog Alarm	June 9, 1897	700 00
Campbell, John	McTavish Point	Nov. 18, 1896	100 00
Crevier, Dolphis	Pointe Claire	May 11, 1888	200 00
Cartier, H. J	Thames River	Oct. 19, 1884	425 00
Cooper, John	Port Arthur	" 14, 1882	†300 00
Cosgrove, George	Victoria Island, Lake Superior	Nov. 14, 1889	350 00
Columbus, Christopher	Penetanguishene and Whiskey Island	Mar. 18, 1893	400 00
Conover, Forrest H. C	Leamington	April 24, 1883	150 00
Cox, John	Morrison or Hawley Island	June 22, 1887	100 00
Chabot, Joseph	Papineauville Range	" 17, 1897	100 00
Connors, Frank	Point Pleasant	Oct. 13, 1898	300 00
Chase, H. J	Weller Bay	Nov. 4, 1898	150 00
Casgrain, Mrs. Kate	Glengarry or Stonehouse Point	May 29, 1903	50 00
Currie, Archibald	Tobermory	Oct. 12, 1903	250 00
Cowan, Thos. M	Stag Island Shoal	Nov. 3, 1903	150 00
Chapman, Richard	Cape Croker Light and Fog Alarm	" 13, 1902	1,050 00
Clark, jr., H	Port Colborne Breakwater, Light and Fog Alarm	May 30, 1904	600 00
Currie, Hector	Flowerpot Island	Aug. 18, 1904	300 00
Cross, J. W	Silver Islet Range	May 18, 1905	100 00
Casgrain, Réné	Caretaker, Cornwall lights	April 1, 1906	300 00
Davieau, Joseph	Corbay Point	May 27, 1890	350 00
Davieau, Hyacinthe	Michipicoten Island	July 1, 1881	400 00
Daoust, Dosithée	McKie Point	Sept. 21, 1893	175 00
Davis, John H	Pigeon Island	May 16, 1896	350 00
Dick, Andrew	Porphyry Point	Aug. 10, 1880	450 00
Dutcher, Samuel	Meaford	May 7, 1877	200 00
Darling, Thomas	Southeast Bay	Jan. 31, 1891	60 00
Dixon, Joseph G	Rosseau	July 21, 1890	100 00
Deault, Alphonse	Beauharnois Lights	April 14, 1903	*200 00
Demers, Wilbrod	Caribou Island Light and Fog Alarm	May 10, 1899	1,000 00
Dulmage, Dorland	Outer Drake or False Ducks Light and Fog Alarm	" 19, 1903	700 00
Duncan, H. G	Wilson Channel Range	—— 1905	350 00

* Allowance of $10 per annum for boat.
† Allowance of $100 per annum, looking after lighted buoys in vicinity.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

ABOVE MONTREAL—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Ead, Mrs. C.	Port Stanley	May 15, 1890.	300 00
Felan, Maurice	Oakville	April 28, 1894.	150 00
Fortier, David H. A.	Port Colborne Range Lights and Fog Alarm	" 11, 1865.	550 00
Fellowes, W. R.	Rondeau Harbour	Dec. 18, 1888.	†350 00
Filiatreault, Thomas	Coteau Landing	May 27, 1890.	140 00
Fieldsted, T.	Gull Harbour, Lake Winnipeg	" 6, 1904.	150 00
Fitzpatrick, —....	Trenton Harbour Range	Jan. 27, 1906.	125 00
Gloude, Benjamin	Dorval	Sept. 7, 1872.	300 00
Gillespie, Wm.	Wolfe Island	Mar. 16, 1885.	250 00
Gordon, Robert	Cobourg	May 16, 1883.	180 00
Griffith, Alfred H.	Giant Tomb	Sept. 17, 1898.	250 00
Gourley, jr., John	Manitowaning	July 3, 1900.	150 00
Gilbert, Philip	Wiarton Pole Light	Sept. 5, 1902.	75 00
Graham, W.	Graham Front Light on Wharf	Dec. 19, 1904.	75 00
Gaulin, E. J.	Pelee Passage	Aug. 2, 1904.	500 00
Hackett, Mrs. A.	Bois Blanc	June 27, 1901.	435 00
Hill, Thomas H.	Lancaster	Aug. 27, 1877.	325 00
Haitze, Jean	Lonely Island	May 11, 1885.	450 00
Hunter, David	Port Dalhousie	Oct. 29, 1879.	350 00
Hawkins, David B.	Peninsula Harbour	Aug. 31, 1891.	500 00
Harvey, James	Thessalon	Nov. 23, 1897.	300 00
Humes, David	Stribling Point Range	Aug. 27. 1902.	180 00
Hughes, Wm.	Red River, Man.	Feb. 12, 1892.	350 00
Johnson, Isaac S.	Cherry Island	Nov. 5, 1883.	300 00
Jeffrey, Carson	Nigger Island Shoal	April 28, 1894.	200 00
Kingston City Clock	Corporation of Kingston	——— 1844.	‡100 00
King, Peter	Slate Island Light	Nov. 17, 1903.	400 00
Knapp, Charles	Lion's Head Wharf Light	Oct. 28, 1903.	75 00
Kilroy, Wm.	Arnprior Island	" 1, 1905.	150 00
King, jr., J. J.	Sulphur Island	May 15, 1905.	300 00
Lidwell, J. J. (temporary)	Middle Island	June 2, 1906.	350 00
Lambert, Wm. McGregor	Chantry Island and Light on Breakwater at Southampton	Oct. 1, 1880.	500 00
Labelle, Louis	Deep River Islet,	May 5, 1897.	100 00
Léger, Thomas	Lower End Lake St. Louis Lights and Lightships	Jan. 5, 1905.	500 00
Lamondin, Louis	Gereaux Island	July 30, 1901.	375 00
Lowe, Robert	Thornbury	April 12, 1887.	80 00
Lowry, Robert M.	Port Elgin	Mar. 14, 1896.	80 00
Larochelle, J. A.	Lake Temiskaming Lights	Oct. 6, 1899.	250 00
Lidwill, John R.	Pelee Island	July 10, 1899.	300 00
Lacroix, H.	Oka	Nov. —, 1898.	130 00
Laberge, Albert	Green Shoal	May 20, 1902.	200 00
Leblanc, J. B.	Lower Narrows	Jan. 4, 1904.	100 00
Lunan, J. W.	Collingwood Lights	" 2, 1904.	350 00
Langlois, L. C.	Pelee Passage	Feb. 25, 1904.	500 00
Lundy, Thos.	Burlington Bay Lights	May 2, 1905.	350 00
Lochore, James	Blind River Wharf	" 31, 1906.	60 00
Manson, Wm. A.	Pelee Passage, Lake Erie, Light and Steam Siren	Nov. 11, 1902.	650 00
Munroe, John Jacob	Lancaster Bar	June 8, 1892.	300 00
Masson, Lucas H.	Point aux Anglais	Sept. 4, 1897.	200 00
Mongeon, Charles A.	Way Shoal	May 23, 1887.	100 00
Matheson, Norman	Cape Robert, Algoma	Oct. 7, 1896.	350 00
Miller, John	Port Credit	Dec. 16, 1897.	150 00
Morrison, Jonathan	Ferris Island	Mar. 24, 1898.	200 00
Matheson, Angus	Gore Bay	July 10, 1903.	350 00
Manson, John	Colchester Reef, Light and Fog Bell	May 1, 1880.	850 00
Miron, Louis	Gargantua	Oct. 26, 1899.	450 00
Murray, William	Barrifield Common Range	May 17, 1900.	150 00
Montgomery, William	Eastern Gap Light, Toronto	Oct. 16, 1895.	300 00
Mason, F. E.	West End of Long Point	June 3, 1901.	400 00
Manders, Samuel	Lower Allumette Lake	July 26, 1901.	100 00
Martin, Edward	Michael Point	June 3, 1902.	120 00
Masters, Fred.	Niagara-on-the-Lake Fog Alarm	Nov. 12, 1904.	400 00
Martin, Mrs. E. A.	Boyd Island	Jan. 6, 1905.	250 00
Matheson, Daniel	Black Bear Island, Lake Winnipeg	June 22, 1899.	200 00

* An annual allowance of $60 as house rent. † An additional $20 per month during winter when light in operation. ‡ Allowance of $3.50 per 1,000 ft for gas.

SESSIONAL PAPER No. 21

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

ABOVE MONTREAL—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
McKenzie, John	Presqu'Isle, Owen Sound, Georgian Bay	July. 14, 1873	200 00
McDonald, Murdock	Point Clark	Jan 8, 1897	400 00
McDonald, Amos	Salmon or Wicked Point	July 12, 1897	300 00
McKillop, Donald	St. Anicet	June 8, 1892	230 00
McKay, Chas. S	Battle Island	Aug. 27, 1877	500 00
McKenzie, William	Strawberry Island	May 4, 1893	300 00
McLeod, Mrs. E	McQuestion Polnt	Feb. 22, 1904	100 00
McAulay, Donald	Saugeen	Mar. 16, 1899	120 00
McDonald, Lauchlin D	Mississagi Island	May 16, 1896	450 00
McCool, James	Fort William Beacon Light, Ottawa River	" 23, 1887	90 00
McDevitt, Chas	Point au Baril Range	Mar. 1, 1897	300 00
McKay, John	Lyal Island	Oct. 27, 1884	450 00
McLean, Arch	Owen Sound	Dec. 23, 1897	150 00
McGaw, Thos	Kincardine	June 13, 1899	400 00
McDougall, Neil	Squaw Island	April 25, 1901	200 00
McKinnon, A	Point aux Pins Lights	May 16, 1904	400 00
McLeod, Kenneth	Cove Island Light and Fog Alarm	June 19, 1903	750 00
McMenemy, Robt	Otter Island	Nov. 17, 1903	400 00
McMaster, And	Nine Mile Point Fog Alarm	April 1, 1900	200 00
McPherson, Geo	Bishops Bay	Mar. 28, 1904	150 00
McSherry, Patrick	Gibraltar Point	May 2, 1905	400 00
McNab, A	Isle Perrot	" 20, 1905	100 00
McLay, D. L	Stokes Bay Range	Aug. 25, 1904	200 00
McKelvie, Geo	Eastern Gap Fog Alarm, Toronto	June 13, 1905	750 00
McKimmie, John	Niagara-on-the-Lake Range	Mar. 30, 1905	150 00
McKay, John	Cockburn Island Wharf	July 1, 1906	50 00
Neaves, Chas	Hamilton Island	July 10, 1906	300 00
Osborne, Chas	Bronte, Ont	Oct. 20, 1906	250 00
Ouelette, Godfrey	Buckom Point	Feb. 23, 1884	200 00
O'Connor, P	Rainy River Lights	June, 23, 1904	250 00
O'Brien, Wm	Pickering	April 14, 1904	125 00
Ottawa Electric Light Co	Britannia	Oct. 1, 1904	150 00
Purvis, John	Great Duck Island Light and Fog Alarm	Mar. 9, 1898	700 00
Pettypiece, Stephen	Lime Kiln Crossing	May 11, 1888	350 00
Prosser, John	Fox Island	Sept. 14, 1896	250 00
Proudfoot, Thos	East Neebish, Upper Range	Nov. 4, 1898	100 00
Poirier, Siméon	Point à Cadieux	May 4, 1904	150 00
Port Darlington Co	Darlington		100 00
Perras, Adolphe	Welcome Island	May 10, 1906	350 00
Rathbun Co	Deseronto	Oct. 14, 1884	200 00
Rains, Evan	Shoal Point, Algoma	Nov. 24, 1884	250 00
Rains, A. M	Sailors' Encampment	Aug. 1892	64 00
Rains, W. W	Rains Wharf Range	" 1892	7 00
Ritchie, John A	South Bay Mouth Range	Sept. 10, 1903	150 00
Richardson, Wm. T	Michipicoten Hr., Algoma	Sept. 27, 1900	200 00
Richardson, Thomas J	Western Islands Light and Fog Alarm	June 27, 1901	80 00
Richmond, John A	Snug Harbour Range	Oct. 7, 1902	350 00
Roussain, J. J	Coppermine Point	June 27, 1904	100 00
Roque, Prank	Killarney Lights	Feb. 28, 1905	400 00
Root, Albert	Grenadier Island	Dec. 15, 1863	250 00
Roddick, Robert	Peter Rock, or Gull Island	Mar. 23, 1872	500 00
Rowe, Geo. Albert	Telegraph Island	Oct. 25, 1895	200 00
Ross, A. M	Wabbi River	" 25, 1895	600 00
Rowan, James	Morris or Victoria Island	Dec 3, 1898	120 00
Sinclair, John B	Providence Bay	Mar. 6, 1906	390 00
Sauve, Honore	Caron Point	May 1, 1889	60 00
Somers, Napoleon	Midland Point Range	June 19, 1900	200 00
Shannon, William	Grosse Point or Valleyfield	Sept 27, 1866	425 00
Shannon, George	" "	" 27, 1886	175 00
Seguin, Grégoire	L'Original	May 8, 1894	100 00
Snaw, Thos. K	Point Edward Range	Aurg 29, 1903	150 00
Smithers, R. O	Mohawk Island	Mar. 31. 1896	*400 00
Sutherland, Jno	Port Burwell	June, 18, 1894	225 00
Schofield, Fergus	Port Maitland	Aprl. 10, 1871	350 00
Simpson, Hedley V	Brighton Ranges	May 11, 1888	540 00
Smith, H. E	Presqu'Isle	April 29, 1898	350 00
Sullivan, Silas	Baskins Wharf	Dec. 22, 1896	130 00
Sauvé, Honoré	Caron Point	Feb. 16, 1898	60 00
Scott, Guy, J	Point Peter, Light and Fog Alarm	June 6, 1901	650 00
Scott, Wm. J	Cornuna Range	April 23, 1901	120 00

* Allowance $10 per annum for boat service. † $10 per annum boat service.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

ABOVE MONTREAL—*Concluded.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Stocker, Jos. L.	Ste. Anne de Bellevue	May 20, 1902.	†125 00
Sweeney, Thomas.	Tomahawk Island	Sept. 19, 1902.	200 00
Sicard, X.	Graham Range, Back Light	April 29, 1905.	75 00
Schade, John	Lake Cecele	Aug. 31, 1906.	250 00
Taylor, Edward	Parry Sound Group	June 3, 1901.	800 00
Thibault, John	North Sister Rock	Dec. 6, 1905.	350 00
Thomas, John.	Georges Island, Lake Winnipeg	Mar. 6, 1906.	350 00
Veech, Stannes	Nine Mile Point Light	Mar. 7, 1894.	450 00
Vallée, Charles	Hope Island	April 20, 1899.	450 00
Vorce, Marcellus	South Bay Point	Nov. 21, 1902.	200 00
Webster, Chas.	Cabot Head, Light and Fog Alarm	May 10, 1898.	650 00
Whitmarsh, John	Snake Island	July 18, 1900.	350 00
Weir, John C.	Belleville	April 4, 1901.	200 00
Wemp, Daniel	Centre Brother Island	Jan. 9, 1901.	200 00
Wilson, Robert	Campbell Island	" 8, 1905.	150 00

BETWEEN MONTREAL AND QUEBEC AND BELOW QUEBEC.

Abel, Phillias	Barre à Boulard, Back Range	June 23, 1903.	75 00
Arcand, Alfred	Seven Islands, Light and Explosive Signal Station	May 20, 1898.	650 00
Auger, A.	L'Islet, Richelieu	Jan. 20, 1905.	150 00
Ascah, James	Fame Point, Gaspé, Light and Fog Alarm	Sept. 2, 1880.	700 00
Arseneau, Nectaire	Etang du Nord	July 21, 1891.	350 00
Arpin, Joseph	Contrecœur Course, Front Light	Sept. 12, 1902.	100 00
Bertrand, Louis	Champlain, Back Pole Light	Sept. 12, 1902.	60 00
Baudet, Mrs. Laurent	Lotbiniere Front Light	" 3, 1903.	80 00
Beaudet, George	Lotbiniere, Back Light	Jan. 4, 1883.	80 00
Beaudet, Charles	Platon Range	Aug. 24, 1894.	120 00
Beaumier, Elzéar	Cape de la Madeline Upper B	Oct. 1, 1905.	100 00
Bourque, Wilfrid	Bird Rocks, Light and Explosive Signal Station	Nov. 15, 1905.	1,300 00
Boulliane, Wm.	Lark Islet Light	Sept. 1, 1872.	400 00
Bertrand, Auguste	Macquereau Point	Dec. 21, 1877.	**300 00
Banville, Joseph	Matane Light	Feb. 1, 1897.	300 00
Bourget, F.	Percé	Mar. 18, 1893.	200 00
Breton, Narcisse	Rich Point	May 16, 1896.	500 00
Bourget, Charles	Cape Despair	Nov. .1, 1897.	†400 00
Bisson, Wm.	Grand River	Oct. 22, 1896.	‡150 00
Bouchard, Louis	Cape Salmon Light and Fog Alarm	May 16, 1896.	600 00
Boucher, Louis	Isle aux Raisins Range	April 13, 1898.	240 00
Boulanger, H.	St. Thomas Wharf and Back Range Light	" 4, 1898.	80 00
Bujold, Louis	Carleton	May 25, 1899.	300 00
Boisvert, Alcide	Cape Charles, Front Light	July 23, 1901.	150 00
Baron, Amedée	Cape Charles, Upper Back Light	June 26, 1901.	90 00
Bouchard, George	St. Irenée	Aug. 31, 1901.	§40 00
Bousquet, Felix	Vercheres Village Back Light	April 21, 1902.	70 00
Bilodeau, Joseph O.	Bellechasse	June 15, 1903.	350 00
Bergeron, Nap.	St. Antoine, Lotbiniere Front Light	Mar. 21, 1902.	80 00
Bordua, Phileas	Ile Deslauriers, Front Light	April 21, 1902.	120 00
Bourdages, Pitre	Point Echouerie	July 25, 1903.	75 00
Boulliane, J. E.	Point Noire Range Lights...¼	Jan. 18, 1904.	200 00
Blanchet, J. G.	Father Point Fog Alarm	——— 1904.	800 00
Brown, Charles	Pointe a-la-garde Lightship	June 26, 1904.	300 00
Brunelle, Jos.	Batiscan	April 27, 1905.	80 00
Belanger, F. L.	Ste. Félicite Fog Alarm	Jan. 14, 1905.	600 00
Bouchard, Wilfrid	Eboulements	April 25, 1906.	50 00
Boudrault, Eustache.	Isle aux Codures	" 20, 1906.	40 00
Carignan, P. L.	Champlain Main Light	Oct. 1, 1902.	80 00
Cormier, Wm.	Amherst Island	April 26, 1871.	350 00
Colton, P. J.	Belle Isle Light and Fog Alarm	Jan. 30, 1902.	*1,100 00
Côté, Luc	Cape Chat Light and Explosive Signal Station	Dec. 3, 1901.	*500 00
Campbell, John W.	Cape Norman Light and Fog Alarm	April 12, 1890.	720 00
Costin, Eugene	Cape Rosier Light and Fog Alarm	Nov. 4, 1890.	800 00
Chamberlain, Caroline	Oak Point Range Lights	Jan. 1, 1906.	75 00

* Allowance, $20 per annum for blowing fog horn; $12 per annum for keeping road in repair. † Allowance, $20 per annum for blowing fog horn. ‡ Allowance, $30 per annum for blowing fog horn. § Per season of navigation.

SESSIONAL PAPER No. 2'

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

BETWEEN MONTREAL AND QUEBEC AND BELOW QUEBEC—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Collins, Geo. F.	Entry Island, Magdalen Islands	July 30, 1901..	250 00
Chenal, John A.	Grand Entry, Magdalen Islands	" 4, 1901..	50 00
Croteau, Télesbpore	Ste. Croix Front Range	Mar. 28, 1901..	70 00
Chicoine, Alphonse	Isle Bouchard, Range Back Light	April 23, 1902..	80 00
Chicoine, F. Xav.	Vercheres Traverse, Front Light	" 21, 1902..	80 00
Charbonneau, Phileas	" " Back Light	" 21, 1902..	70 00
Comtois, Joseph	Isle Ste. Thérese, Back Light, Isle Deslauriers, Range	Feb. 11, 1903..	80 00
Carriere, H.	Boucherville, Isle St. Joseph	Aug. 26, 1903..	80 00
Caisse, Louis	Petite Traverse, Contrecœur, Front Light	April 22, 1904..	100 00
Caron, Alphonse	Lower Traverse, Light and Fog Alarm	Oct. 11, 1902..	500 00
Coulombe, M.	Chlorydormes	" 15, 1904..	100 00
Chartier, Adolphe	Hochelaga Lights, Montreal Harbour	Aug. 5, 1904..	25 00
Couillard, A.	East Point, Anticosti, Lightship	May 27, 1904..	1,000 00
Chisholm, John	New Carlisle, Wharf Light	Aug. 1, 1903..	
Chevrier, P.	Byron Island	June 23, 1905..	400 00
Cunningham dit Caudé, E.	Cap aux Corbeaux, Bay St. Paul, Wharf Light	——— 1905..	70 00
Caron, Elisse	Métis	April 1, 1906..	300 00
Cournoyer, Pierre	St. Anne de Sorel F	Mar. 28, 1906..	100 00
Dermarais, Philéas	River St. Francis	July 2, 1897..	†20 00
Demers, Antoine	Pointe a Basile, Back Light	" 22, 1904..	130 00
Douville, Elzéar	" Front Light	Feb. 6, 1904..	130 00
Doré, Francois	St. Antoine, Lotbiniere Back Light	Mar. 21, 1902..	120 00
Dubois, Louis	Isle a la Bague	April 14, 1903..	150 00
Dubois, Octave	Greenly Island, Light and Fog Alarm	Oct. 12, 1903..	800 00
Ducharme, Jos.	St. Ours, Traverse	April 18, 1904..	100 00
Duval, Norbert	Contrecoœur Course, Back Light	" 22, 1904..	100 00
Daigle, Nap.	Barre a Boulard, Front Range	May 28, 1904..	200 00
Desbiens, Eugene	Poste St. Martin, Front Light	April 12, 1905..	50 00
Electric Light Company of Roberval	Roberval Beacon Lights	June 21, 1899..	100 00
Fournier, Alfred	Upper Traverse	April 14, 1900..	600 00
Fugere, Léandre	Batiscan, Front Light	" 29, 1868..	80 00
Fiset, Jean H.	Lake St. Pteer, Lightship No. 2	" 22, 1875..	500 00
Fantaine Edmond	Cape Bauld, Lighthouse and Fog Alarm	— — 1905..	800 00
Faffard, Victor	Point de Monts, Light and Explosive Signal Sta.	Aug. 1, 1889..	††500 00
Farser, Pierre T.	Red Islet	April 12, 1890..	ŝ450 00
Ferland, Nap.	Ste. Petronille	Sept. 3, 1901..	150 00
Fletcher, James	Longue Pointe, Traverse	May 16, 1904..	125 00
Fournier, Arthur	Grande Vallée	Oct. 15, 1904..	100 00
Filteau, E.	Ste. Emélie, Back Light	Mar. 16, 1905..	80 00
Gingras, Omer	Becancour F	Oct. 24, 1905..	150 00
Geoffrion, Azarie	Varennes	May 1, 1903..	70 00
Giguere, Denis	Lavaltrie Range	" 24, 1870..	300 00
Grenier, Solomon	Newport Point	June 3, 1897..	150 00
Guyon, Joseph	Vercheres Village, Front Light	April 21, 1902..	80 00
Gagné, Francois	L'Ange Gardien, Island Orleans, Front Light	Nov. 10, 1902..	70 00
Granier, Henri	Bersimis, Range Lights	Aug. 8, 1903..	100 00
Goudreault, Wm.	Isle au Belier, Lake St. John	Oct. 30, 1901..	75 00
Girard, Henry	Murray Bay, Wharf Light	July 13, 1903..	50 00
Godbout, Joachim	St. Laurent, Island of Orleans	April 15, 1904..	300 00
Guyon, Ernest	Contrecœur, Vercheres Range, Back Light	Nov. 11, 1904..	125 00
Goudreau, Mrs. Luce	Riviere du Moulin, Back Light	May 9, 1905..	50 00
Hebert, Moise Manuel dit	Cap de la Magdeleine, Lower Range, Front Light	May 11, 1888..	80 00
Harvey, André	Chicoutimi Wharf Light	" 30, 1889..	40 00
Houde, Emile	Grondines Point Range, Back Light	June 20, 1904..	100 00
Horrie, Arthur	Port Daniel Wharf	——— 1906..	100 00
Irvine, John T. A.	Red Island Lightship and Fog Whistle	Mar. 2, 1900..	*500 00
Kennedy, Thomas	Sandy Beach	Aug. 9, 1904..	400 00
Landry, Elie	Natastquan	June 25, 1906..	250 00
Lacourse, Ernest	Cape Madeline Village	Mar. 13, 1906..	200 00
Lafleche, Désiré	Lake St. Peter Lightship No. 1	April 12, 1887..	450 00
Lachapelle, Jean B.	Repentigny, Front Light	Feb. 1, 1861..	75 00
Langlois, Antoine	River du Chene, Langlais Point	July 11, 1888..	125 00
Laliberté, Arthur	Ste. Emelie, Front Range	Sept. 24, 1880..	90 00

* Allowance, $100 per annum for horse-keep. ** Allowance, $25 per annum for hauling supplies. † Allowance, $700 for two assistants and $200 for board during season of navigation. " Per month during season of navigation. With a crew for the vessel, paid by the department. † Per month during season of navigation. †† Allowance of $75 per annum for horse-keep. †† Allowance of $50 per annum for horse-keep. ŝ Allowance of $50 per annum for water, &c.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

BETWEEN MONTREAL AND QUEBEC AND BELOW QUEBEC—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Lord, Joseph	North of Halfway Point Range	May 5, 1903	170 00
Laporte, Ivon	Ile Marie Light, Bouchard Range	April 21, 1902	120 00
Lapointe, F. X	Isle a l'Aigle Range, Front Light	May 1, 1903	100 00
Lavoie, M	Riviere Valin Range	——— 1893	80 00
LeHuguet, Francois	Cape Gaspé Light and Explosive Signal Station	Oct. 22, 1896	650 00
Lindsay, Wm	Gaspé Wharf Light	June 14, 1900	42 00
Lindsay, R. W	Green Island Light and Explosive Signal Station	Sept. 25, 1888	650 00
Loisel, John	Paspebiac	Aug. 27, 1894	†150 00
LeBlanc, Régis	White Island Reef Light-ship and Fog Whistle	Jan. 11, 1878	‡500 00
Lemieux, Z	South-west Point, Anticosti	July 10, 1900	600 00
Lachance, Louis	St. John, Island of Orleans	Sept. 26, 1896	300 00
Leclerc, Geo	Pillars and Algernon Rock Lights	July 30, 1901	650 00
Lavoie, F	Anse St. Jean Wharf Light	Mar. 13, 1889	40 00
Levesque, Arthur	Grande Isle, Kamouraska	Feb. 19, 1901	400 00
Leclerc, Auguste	Martin River	Sept. 3, 1902	300 00
Lemieux, F. X	Barachois de Malbaie	Mar. 6, 1903	60 00
Laprise, Emile	Anticosti South, Point Light and Fog Alarm	April 18, 1903	800 00
Levesque, Dom	Pointe aux Origineaux	Oct. 5, 1903	350 00
Lepage, Joseph	St. Francis, Islands of Orleans, Front Liht	April 20, 1876	75 00
Lacroix, Frs. Joseph	Contrecœur Traverse, Front Light	" 14, 1904	75 00
Lacroix, Alfred	" " Back Light	July 26, 1904	100 00
Letendre, Louis	Ile de Grace, Sorel	April 1, 1906	100 00
Letourneau, Louis	Mont Louis	" 1, 1906	100 00
Lavoie, Ubaid	Rimouski Wharf	May 22, 1906	50 00
Lefrancois, X	St. Anne des Monts	———	100 00
Lanciault, Frs	Ste. Anne de Sorel, B	Mar. 28, 1906	100 00
Laporte, J. B	St. Ours Traverse, Front Light	——— 1904	125 00
Lefrancois, H	Ste. Anne des Monts	Oct. 15, 1904	100 00
Letourneau, Louis	Mont Louis	" 15, 1904	100 00
Lobel, Esdras	Lower Traverse Lightship	April 21, 1900	2,300 00
Labrouche, W	Monté du Lac or Cap Brulé	May 2, 1905	400 00
Lavallée, J	Flower Island, Nfld	April 12, 1905	600 00
Massicotte, Jos	Champlain, Upper Front	April 1, 1906	100 00
Manseau, Francois	Fort St. Francis	Mar. 27, 1900	240 00
Malo, Joseph	Isle Ste. Thérese, Lower Range	Feb. 1, 1897	130 00
Marchand, Ferdinand	Citrouille Point	April 27, 1896	200 00
Martin, Paul	St. Valentine Range	April 28, 1873	150 00
Molson, Mrs. Alexander	Molson's Island, Lake Memphremagog	From year to year	**2 50
Malouin, Alfred	Anticosti, West Point, Light & Explosive Signal Station	July 1, 1877	††750 00
Marceau, Louis	St. Francis, Island of Orleans, Back Light	April 1, 1884	75 00
Mayrand, Eugene	Grondines, Upper Range, Front Light	June 20, 1904	125 00
Morin, Hypolite	Long Pilgrim	April 29, 1898	|| 340 00
Marcotte, Mrs. P. L	Point Bleue, Lake St. John	Nov. 28, 1898	40 00
Morin, Alex	Riviere à la Pipe	Oct. 3, 1901	50 00
Morin, Alfred	Anse aux Griffons	" 15, 1904	100 00
Martel, C. E	Georgeville Wharf Light	May 19, 1905	**1 50
McGee, James A	Ash and Bloody Island	" 26, 1903	200 00
McWilliam, John J	Father Point Light	June 1, 1876	*450 00
	Port Daniel	Oct. 7, 1902	60 00
Mourant, John	Gascons Wharf	June 8, 1906	50 00
Morin, Nazaire	Grosse Roche	" 25, 1906	500 00
Paré, Olivier	L'Ange Gardien, Island of Orleans, Back Light	Nov. 10, 1902	70 00
Pelletier, Tancrede	Egg Island	July 1, 1901	500 00
Paquin, Sylva	Pointe du Lac	May 2, 1900	100 00
Paul, Edouard	Isle de Grace	Sept. 7, 1871	240 00
Peters, D. E	Witch Shoal, Lake Memphremagog	June 1, 1891	†4 00
Peters, J. H	Black Point, Lake Memphremagog	" 1, 1891	†1 50
Patterson, J. A	Wadleigh Point, Lake Memphremagog	" 1, 1891	†1 50
Paquet, Pierre	Ste. Famille, Back Range, Orleans Channel	Oct. 19, 1885	70 00
Poulin, Alfred	Ste. Famille, Island of Orleans, Front Light	" 26, 1898	70 00
Pinault, Louis	Bicquette Island Light and Fog Alarm	Oct. 6, 1900	700 00
Perrault, Henri	St. Pierre les Becquets	May 26, 1901	70 00
Pilote, Auguste	Poste St. Martin, Back Light	——— 1885	50 00
Pothier, Louis	Champlain, Upper Back Range	April 1, 1906	100 00
Puize, L. J	Riviere du Loup, Wharf Light	——— 1906	70 00
Reaves, Samuel	Ile Ste. Thérese, Upper Range	Oct. 12, 1870	270 00
Richelieu and Ontario Navigation Co	Sorel Wharf Lights		85 00
Rivet, Léon	Repentigny, Back Light	April 28, 1894	75 00

*Allowance of $1,900 per annum for assistance of engineer and necessary crew. †Allowance, $30 per annum for blowing foghorn. ‡Allowance $2,300 per annum for assistance of Engineer and necessary crew. | Allowance $50 per annum for horse keep. **Per week during session of navigation. || Allowance of $50 per annum for horse keep. ‡‡Allowance of $20 per annum for horse keep. || Allowance of $68 per annum, &c.

*Allowance of $10 per annum for water. †Per week during season of navigation. | Per month during season of navigation. ‡Allowance $50 per annum for horse keep.

SESSIONAL PAPER No. 21

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

BETWEEN MONTREAL AND QUEBEC AND BELOW QUEBEC—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Richard, Alphonse	Brandy Pots	Oct. 7, 1878	400 00
Rennie, E. H	Cape Ray, Light and Fog Whistle	" 19, 1884	800 00
Roberge, C. Honoré	St. Pierre, Back Range, Orleans Channel	" 19, 1885	70 00
Rodrique, Joséphine	Portneuf	May 16, 1903	250 00
Racette, Widow of D	Ste. Croix, Back Range	Dec. — 1900	70 00
Roy, Charles	Bellerive Park Lights, Montreal Harbour	Aug. 5, 1904	25 00
St. Laurent, E	Petite Traverse Contrecœur, Back Light	April 22, 1904	100 00
Sailvail, Omer	Isle à la Pierre	May 6, 1897	220 00
Savarie, Eusebe	Isle à l'Aigle, Back Range Light	" 1, 1903	100 00
Savard, Dorilas	Savards Range		80 00
Sasseville, F. J	Cape Magdalen, Light and Fog Whistle	June 9, 1886	700 00
Ste. Croix, George	Point Peter	Oct. 22, 1896	450 00
Savard, Hy	St. Siméon Wharf	" 25, 1906	40 00
Savard, Jno	River Caribou Front Light	Aug. — 1898	50 00
Simard, H	" Back Light		50 00
Sauvageau, Achille	Grondines Point Range, Front Light	June 20, 1906	250 00
Sauvageau, Jos	Grondines Upper Range, Back Light	" 20, 1904	100 00
Samuel, Andr	Fox River	Oct. 15, 1904	100 00
Tourigny, A	Becancour	Oct. 24, 1905	100 00
Thurber, Mrs. Wm	Ste. Croix	March 28, 1901	175 00
Tremblay, W. T	Goose Cape	April 4, 1888	250 00
Tremblay, Edmond	Portneuf en bas	May 16, 1903	300 00
Tremblay, George	River du Moulin, Front Light	Sept. 19, 1889	50 00
Tremblay, Pitre	St. Alphonse Wharf Light	June 19, 1895	40 00
Tremblay, Henry	Cap à l'Aigle Wharf Light	Feb. 6, 1896	40 00
Tremblay, Alexis	Heath or East Point, Anticosti, Light and Explosive Signal station	July 25, 1900	600 00
Tetreault, Honore	Contrecœur, Verchores Range, Front Light	Nov. 11, 1904	125 00
Tessier, Armand	Pointe Bleue	June 9, 1904	††40 00
Thomas, Paul	Belle Isle, North End, Light and Fog Alarm	July 8, 1904	1,100 00
Toupin, P	Cape Madeleine, Lower Range, Back Light	April 26, 1905	80 00
Vaillancourt, Godfrey	Cape de la Madeline, Upper Range, Front Light	Oct. 1, 1906	75 00
Vigneau, Placide	Perroquet Island	Sept. 19, 1892	600 00
Vezina, Olivier	St. Pierre, Front Range, Orleans Channel	Oct. 28, 1897	70 00
Vezina, Desire	Crane Island	April 26, 1904	320 00
Whitman, Wm. Gunn	Lacolle Range	Jan. 18, 1904	150 00
Wheeler, W	Lead Mines, Lake Memphremagog	June 1, 1891	*1 50
Wyatt, Thomas M	Amour Point, Forteau Bay, Light and Fog Alarm	Oct. 18, 1889	†1,100 00
Willett, B. V	New Richmond, Duthie Point	" 16, 1903	60 00
Weaner, B	Lake St. Peter Light ship No. 3	May 7, 1904	400 00

NEW BRUNSWICK.

Andrews, Hugh	Partridge Island	May 1, 1906	1,200 00
Arseneau, James	Dalhousie Harbour	June 18, 1894	100 00
Allain, Joseph	Hay Island Beacon Light	May 21, 1895	150 00
Bour , John	Oak Point	July 1, 1906	100 00
Balmer, Matthew	Oak Point, St. John River	April 27, 1900	80 00
Barbour, Jas, G	Cape Enrage Light and Fog Alarm	May 11, 1888	800 00
Bent, A. J. Percy	Jourimain	Jan. 25, 1901	300 00
Blacklock, Fred. G	Cape Spencer	Mar. 2, 1888	400 00
Brown, Charles	Quaco West End Light	Nov. 25, 1884	400 00
Bradshaw, L. B	Quaco West Head Fog Alarm	Aug. 2, 1887	400 00
Brune, John David	Goose Lake	May 11, 1888	‡250 00
Boudreau, Jos. B	Petit Rocher	Feb. 26, 1896	150 00
Blakley, Lawrence	Harper Point	Sept. 9, 1887	75 00
Bellemore, F	Dipper Harbour	Mar. 12, 1895	100 00
Belliveau, A. P	Fort Folly Point	June 23, 1903	225 00
Brennan, Robert	Oromocto	Mar. 18, 1903	80 00
Belding, R, L	Lepreau Light	June 30, 1905	550 00
Basque, F. D	North Tracadie Range	Aug. 20, 1904	275 00
Burnham, Rupert	Big Duck Island	June 25, 1906	550 00
Cochran, Fredk. M	Quaco Pier Light	Mar. 25, 1892	100 00
Cummings, Geo	Campbellton Range Light	Jan. 1, 1880	100 00

*Per week during season of navigation. † Allowance of $75 per annum for horse keep. ‡ Allowance of $12 per annum for supplying water.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

NEW-BRUNSWICK—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Chapman, James	Baie du Vin Island Range Light	July 24, 1882	200 00
Crandall, D. H	Greys Point Pole Light	April 13, 1900	70 00
Carney, John W	Perry Point	Sept. 25, 1900	80 00
Copp, A. B	Anderson Hollow	Mar. 30, 1903	100 00
Cormier, Jadus P.	Buctouche Bar	July 26, 1902	200 00
Corey, Chas. H	Head Harbour Fog Alarm	June 15, 1903	700 00
Chaffey, Harry V	Cherry Island Fog Bell	Aug. 7, 1903	150 00
Dickson, Elia C	Pea Point	Nov. 16, 1898	250 00
Delaney, John	Grand Beach Light	Oct. 7, 1880	125 00
Dalzell, Geo. Y	Swallow Tail	Mar. 18, 1893	400 00
DeGrace, John	Indian Point	June 4, 1889	150 00
Day, W. A	Belyea Point	Sept. 20, 1899	90 00
Daigle, U. D	Black Lands Gully	July 13, 1903	100 00
Daigle, Victor	Sapin Point	May 28, 1903	25 00
Doucett, Fred. F	Caraquet Front Range Light	Oct. 14, 1903	50 00
Dalzell, Coleman Grant	Gannet Rock and Explosive Signal Station	July 1, 1904	700 00
Dakin, Lloyd Chas	Grand Harbour	May 2, 1904	400 00
Egan, Edward H	Belloni Point	May 17, 1902	100 00
Eldridge, John M	Drews Head, Beaver Harbour	" 2, 1904	250 00
Frankland, Louis	Gull Cove	Nov. 14, 1902	80 00
Frawley, Frank	Lepreau Fog Alarm	June 30, 1905	900 00
Flewelling, Mrs. M	Flewelling Landing	April 12, 1890	80 00
Fanjoy, William	Fanjoy Point, Grand Lake	Dec. 15, 1897	80 00
Ferguson, W. G	South Tracadie	Mar. 23, 1898	150 00
Fox, Fraser	Gagetown, St. John River	April 22, 1904	80 00
Fitzgerald, Warren	Head Harbour Light	June 29, 1904	300 00
Gould, Francis T	Shediac North Channel Range	Jan. 13, 1899	70 00
Gregg, Wilson	St. John Harbour Beacon	——— 1901	350 00
Hendry, Mrs. A. M	Hendry Farm	April 28 1899	80 00
Hayden, Michael	Pokemouche	Oct. 17, 1888	300 00
Henderson, Arthur	Midjic Bluff	" 4, 1894	200 00
Hamm, Chas. P	Musquash	Jan. 14, 1879	300 00
Helms, Geo	Letite Passage Fog Whistle	May 3, 1882	*580 00
Hachey, Octave	Pokesudie Island	July 12, 1881	180 00
Harvey, W. L	Machias Seal Island Light and Fog Alarm	" 8, 1904	1,000 00
Hannah, Mrs. B. G	Spruce Point	Sept. 15, 1892	120 00
Harts, Thos	Shediac Harbour Lights	Feb. 17, 1905	80 00
Hooley, John	Tiner Point Fog Alarm	June 30, 1905	500 00
Ingalls, Turner	Southwest Head, Grand Manan	Dec. 4, 1900	500 00
Kilpatrick, Joseph	Passamaquoddy Bay	Feb. 3, 1898	350 00
Lantaigne, Gervais	Caraquet Island	June 16, 1888	200 00
Leblanc, Charles P	Cassie Point	May 4, 1872	250 00
Looney, Thos. E	Greenhead, St. John River	July 14, 1886	200 00
Lochart, Edwin	Ward Point	Oct. 20, 1903	80 00
Legere, P. L	Caraquet Back Range Light	" 14, 1903	50 00
Mills, George	Fox Island, N. W. Point	June 23, 1897	200 00
Morrison, Peter, Jr	Portage Island	May 17, 1892	300 00
Morrison, Duncan	Sheldrake Island Lights	Feb. 25, 1880	300 00
Maillet, D. O	Buctouche Inner Range	July 7, 1883	150 00
Matheson, R. B	Newcastle	April 18, 1898	100 00
Murray, Michael	Middle Island	" 10, 1902	200 00
Maloney, Wm	Marks Point	Nov. 7, 1903	120 00
McLeod, J. H	Bliss Island	Oct. 17, 1900	350 00
McLennan, Kenneth	Escuminac Light and Fog Alarm	Mar. 7, 1892	750 00
McIntosh, Chas	Lower Neguac Wharf Lights	Dec. 10, 1892	100 00
McBaine, Alex	Cox Point, Grand Lake	May 6. 1898	80 00
Macdonald, R. P	Musquash Island	Jan. 28, 1901	80 00
McMann, Robert Harvey	McMann Point	Nov. 2, 1901	80 00
McNeil, Henry H	Dalhousie Beacon Lights and Douglas Island Lt.	Jan. 1, 1880	250 00
McConnell, J. Robert	Miscou Gully	Sept. 9, 1887	100 00
McLean, R	Miramichi Bay Lt. Ship	April 12, 1902	‡400 00
Nevers, George F	Jemseg	Nov, 24, 1884	80 00
Preston, S	Preston Beach Lights	July 11, 1889	125 00
Pendlebury, Wm. J	St. Andrews	April 10, 1889	250 00
Pickett, Robert E	Palmer's Landing Wharf Light	May 11, 1897	80 00

*Allowance $50 for keeping light. ‡Allowance $300 for assistance.

SESSIONAL PAPER No. 21

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

NEW BRUNSWICK—*Concluded.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Parker, Alvin	Mulholland Point	June 13, 1901	200 00
Palmer, E. B	Hampstead Wharf	Nov. 6, 1900	80 00
Russell, James R	Grindstone Island Light and Fog Alarm	Jan. 13, 1899	700 00
Robichaud, Joseph L	Miscou Light and Fog Whistle	Nov. 11, 1902	800 00
Robinson, John	Neguac Main Light	June 30, 1896	150 00
Richard, Peter F	Richibuctou Head	May 30, 1895	185 00
Robertson, Charles M	Robertson Point, Grand Lake	June 30, 1897	80 00
Robertson, Meier	Shediac Island Range	Dec. 29, 1873	250 00
Ross, Elijah	Negro Point	Mar. 5, 1878	400 00
Robichaud, Jude	Richibuctou Channel Range	June 16, 1902	200 00
Robichaud, Henri B	Buctouche Range	June 21, 1884	150 00
Roherty, J. A	Little Belledune	Feb. 21, 1905	100 00
Robertson, J. A. D	Heron Island	April 1, 1902	200 00
Richard, Jos. F	Richibuctou Bar Outer Range	June 16, 1902	150 00
Splane, Alfred	Pines Point Fog Alarm	Aug. 21, 1905	750 00
Sutherland, Geo. C	Bathurst Harbour Range	Mar. 20, 1882	200 00
Scott, Mrs. Ed	Stonehaven	July 8, 1904	100 00
Spragg, T. W	Hatfield Point	June 27, 1903	80 00
Savon, Adelard	Shippegan	April 20, 1906	280 00
Tatton, Geo. T	Long Eddy Point Fog Whistle, Grand Manan	Oct. 16, 1866	750 00
True, John Howard	Wilmot Bluff	Sept. 12, 1899	80 00
Upton, Robert	Bridge Point	" 11, 1899	80 00
Williston, Seymour	Swashway Range, Fox Island	June 4, 1902	300 00
Wagner, Richard	Sand Point, St. John River	" 7, 1883	80 00
Williams, Forrest W	Williams Landing	May 11, 1897	80 00
Wright, Ethelbert	Southern Wharf	Mar. 6, 1906	500 00

NOVA SCOTIA.

Amero, Chas. A	Argyle	Nov. 9, 1897	400 00
Amero, Geo. D	Pubnico	Feb. 6, 1893	240 00
Amirault, James	Sissiboo	July 11, 1899	200 00
Beaman, Edwin	Digby Pier	May 29, 1897	100 00
Bonner, John Charles	Point Aconii	Nov. 6, 1903	200 00
Burgess, Watson	Port l'Hébert	July 26, 1892	150 00
Boutillier, R. J., Supt	Sable Island Humane Est	Nov. 13, 1884	*700 00
Boutillier, Henry	Indian Harbour, Paddy's Head	June 6, 1901	150 00
Bollong, James	Pope Harbour	Aug. 6, 1877	300 00
Bourgeois, Philip	Cheticamp Range	May 23, 1898	150 00
Boudrot, B	Paulamon, Hawk Islet	Dec. 7, 1904	250 00
Baker, Thomas	Peases Island	May 19, 1879	350 00
Brackett, Wm	Herring Cove	Aug. 28, 1897	100 00
Belliveau, John H	Belliveau Cove	Feb. 16, 1889	80 00
Brownell, Luther	Cold Spring Head	Mar. 27, 1901	120 00
Buchanan, Angus A	Neil Harbour	Aug. 14, 1899	150 00
Buckman, Chas	Grand Passage	Jan. 7, 1901	250 00
Boudreau, W. C	Port Felix	July 16, 1902	250 00
Burke, Henry	Country Harbour, Green Island	June 11, 1902	400 00
Burke, Martin	Bourgeois Inlet	Dec. 1, 1902	60 00
Burns, E. M	Wedge Island	July 6, 1904	400 00
Burgess, Lewis E	Walton Harbour	" 13, 1903	150 00
Breen, Michael	Flint Head	Aug. 20, 1904	450 00
Bishop, E. W	Porters Point	April 29, 1904	100 00
Baker, John	Mary-Joseph	Jan. 6, 1905	300 00
Buchanan, M	Munroe's Point		150 00
Boyle, Geo	Wallace Harbour Range	May 23, 1905	150 00
Chiasson, Germain	Caveau Point Range Lights	Aug. 20, 1897	150 00
Chiasson, Joseph P	Grand Etang, Inverness	May 21, 1901	60 00
Creighton, H. H	Creighton Head	" 6, 1874	200 00
Connington, Thomas	Lousburg Range Lights	Oct. 26, 1897	200 00
Crowell, John	Seal Island Light and Fog Alarm	" 14, 1899	800 00
Campbell, John M,. supt	St. Paul Island Humane Establishment	Nov. 16, 1904	700 00
Campbell, J. O	Port Mouton	April 29, 1898	300 00
Campbell, S. C	St. Paul Island Fog Alarm	June 23, 1905	500 00
Comeau, Louis C	Meteghan River	Oct. 12, 1875	100 00
Cambbell, John P	Red Islands, C.B	Nov. 30, 1901	120 00

*With board for self and family and assistants and allowance for salaries of staff.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

NOVA SCOTIA—*Continued.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Croucher, George A	Croucher Island	Jan. 31, 1883	300 00
Clough, Daniel	Grand Digue Pole Light	July 4, 1884	60 00
Clory, Abraham	Glasgow Point	" 25, 1894	150 00
Coolen, Albert S	Hubbard Cove	Oct. 31, 1903	250 00
Cameron, L. G	Beaver Harbour	Feb. 15, 1902	150 00
Christian, P. E	Betty Island	June 29, 1904	500 00
Creelman, Samuel	Port au Pique	May 2, 1901	25 00
Campbell, D. A	Louisburg Fog Alarm	Mar. 20, 1902	920 00
Cunningham, A. H	Cape Sable Light and Fog Alarm	July 16, 1902	800 00
Cohoon, Havelock	Cranbury Island Light and Fog Alarm	Sept. 7, 1903	800 00
Corbett, George	Port Larue	May 31, 1904	260 00
Clark, F. R	Borden Wharf	April 29, 1904	100 00
Chisholm, John B	McMillans Point	Dec. 2, 1905	150 00
Doane, T. S	Yarmouth or Cape Forchu Light & Fog Alarm	Dec. 31, 1904	800 00
Doyle, Edward	Mabou Front Range Light	June 14, 1897	70 00
D'Entremont, W. H	Abbot Harbour	May 22, 1888	90 00
Dewis, F. H. P	Cap d'Or Fog Alarm	April 13, 1898	800 00
Duann, Wm. A	Green Island, Richmond	May 20, 1902	500 00
Dunn, Miles A	Margaree Harbour, Outer Range Light	" 12, 1903	50 00
Doane, F. H	Bunker Island	July 27, 1904	350 00
Davison, Geo. E	Noel	April 25, 1906	100 00
Ellis, Wm. E	Point Prim or Digby Gut, L. H. & F. W	Mar. 8, 1875	800 00
Earley, John	Margaretsville	Feb. 19, 1887	230 00
Elderkin, H. E	Apple River Light and Fog Alarm	Mar. 31, 1905	700 00
Fraser, Alexr	Great Bras d'Or Range, Back Llght	Jan. 13, 1903	100 00
Flsher, Joel W	Baccaro or Barrington	Aug. 8, 1893	450 00
Fulker, Wm. G	Devil Island	May 3, 1886	420 00
Firth, Charles M	Coffin Island, Liverpool	June 30, 1880	400 00
Foster, Israel C	Port Medway	Oct. 13, 1892	260 00
Foster, Samuel T	Port Medway Breakwater	Feb. 17, 1899	100 00
Foster, Geo. M	Port George	Nov. 19, 1897	100 00
Faulkner, W. Y	Burnt Coat	June 22, 1898	250 00
Findlay, John H	Bull Point, Sambro Harbour	Dec. 7, 1899	100 00
Franklin, J. L	Wolfville	April 4, 1902	100 00
Falconer, David	Caribou Island	Dec. 20, 1902	300 00
Finlayson, A. Wm	St. Esprit Island	April 12, 1905	400 00
Gillis, Duncan	Point Tupper	April 1, 1906	300 00
Gilkie, Henry A	Sambro Light and Explosive Signal Station	Jan. 8, 1867	800 00
Giffin, Ira L	Isaac Harbour	April 28, 1894	200 00
Gardner, Frederic T	Brooklyn Pier Pole Light	Feb. 6, 1885	100 00
Gallant, Patrick	Little Loraine	Jan. 19, 1900	80 00
Goodwin, Jas. E	Wood Harbour	Aug. 27, 1900	200 00
Garrison, S. H	Peggy Point	Dec. 22, 1902	350 00
Gray, Peter Angus	Pennant Harbour	June 30, 1903	100 00
Gerrion, Michael	West Arichat	—— 1906	100 00
Harpell, Jeremiah	Jeddore Harbour Range	Jan. 21, 1901	200 00
Hopkins, Leslie	Bon Portage Island	Oct. 20, 1897	350 00
Huntley, Charles H	Kingsport	June 30, 1890	100 00
Hawley, Mathew	South Bay, Ingonish	May 13, 1897	140 00
Hardy, John	Gabarus	Nov. 22, 1890	200 00
Hardy, Joseph W	Guion Island	Jan. 30, 1903	400 00
Hinds, James	Victoria Beach	Mar. 7, 1901	100 00
Hemlow, James S	Liscomb	Jan. 2, 1903	300 00
Hunt, Wm	Bear River	April 10, 1905	150 00
Hanlon, James P	Cranberry Island Light and Fog Alarm		800 00
Holland, Richard	Chibucto Head Light and Fog Alarm	Oct 1, 1906	800 00
Iceton, Wm	Mauger Beach Light and Fog Alarm	July 8, 1903	800 00
Joyce, Simon	Seal Island, Lennox Passage	July 4, 1884	150 00
Jamieson, Chas	Cape St. Lawrence	Sept. 21, 1893	400 00
Jamieson, Geo. C	Cole Harbour Range	Oct. 21, 1898	150 00
Knowlan, Alfred	Queensport	Nov. 13, 1902	300 00
Kent, J. H	Musquodoboit Harbour Range Front Light	April 29, 1904	125 00
Kent, John	Musquodoboit Harbour, Back Light	" 29, 1904	100 00
Long, Joseph	Canso Harbonr	Dec. 31, 1896	250 00
Long, Joseph	False Passage Ledge	Aug. 4, 1903	50 00
Leblanc, Severin	Tusket River	July 1, 1889	250 00
Lowden, David	Pictou Harbour Range	" 12, 1897	150 00

Allowance $35 per month for assistance.

SESSIONAL PAPER No. 21

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

NOVA SCOTIA—*Continued.*

Name.	Name.	Appointed.	Salary.
			$ cts.
LaVashe, Wm.	Arichat	Oct. 17, 1898..	250 00
Lyons, John H.	Barrington East Bay Light Ship	June 18, 1897..	600 00
Landry, Edward	Petit de Grat	Feb. 23, 1897..	200 00
Larkin, Ephraim	Stoddart Island	Mar. 18, 1896..	200 00
Leblanc, Benjamin	Candle Box Island	Nov. 1, 1892..	300 00
Larkin, N. C.	Lurcher Shoal Light-ship	" —, 1904..	†1,200 00
Leblanc, S. B.	Grand Etang	Mar. 25, 1905..	60 00
Lynch, M.	McNab Island	June 23, 1905..	300 00
Lewis, A. J.	Sydney Range Back Light	May 22, 1905..	150 00
Morash, Edward	Dover Harbour	Oct. 1, 1906..	200 00
Morel, B. H.	Brier Island, Fog Whistle	June 6, 1901..	400 00
Morrison, M. D.	Black Rock Point	" 8, 1892..	250 00
Muise, Marcelin	Cheticamp	Nov. 27, 1896..	300 00
Misener, John E.	Fort Point	May 16, 1896..	150 00
Moser, Samuel	Moser Island	Nov. 6, 1885..	350 00
Mullins, James	Mullins Point	June 8, 1892..	200 00
Munro, William	Pictou Bar	Nov. 22, 1890..	460 00
Murphy, Michael	Pomquet Island	Dec. 18, 1890..	350 00
Mundell, Edward	Eddy Point	July 28, 1903..	400 00
Martell, John T.	Scatterie Light and Fog Whistle	" 30, 1897..	800 00
Murray, John	Cape George, Great Bras d'Or Lake	Nov. 3, 1882..	200 00
Munroe, William L.	Tree Top Island	Oct. 28, 1879..	325 00
Mitchell, John W	Jeddore Rock	Sept. 29, 1882..	400 00
Mitchell, Wm. A	Quaker Island	Feb. 19, 1896..	300 00
Matheson, Murdock	Whycocomah Pole Light	Sept. 11, 1884..	60 00
Morrison, Mrs. L.	Freestone Islet Pole Light	June 5, 1897..	150 00
Mauger, John J.	Cape LaRonde	Nov. 16, 1898..	300 00
Melanson, J. W	Gilbert Point	Aug. 18, 1894..	300 00
Morris, P. E.	Isle Haute	" 2, 1904..	500 00
Morris, John H.	Advocate Harbour	" 10, 1904..	250 00
Myrick, John	Cape Race, Newfoundland, L. H. & F. W.	Nov. 1, 1897..	1,000 00
Mathews, Wm. J.	Canso Range	Dec. 17, 1904..	200 00
Martin, Charles	Catch Harbour	May 19, 1905..	80 00
McDonald, Robert	Carter Island	Jan. 4, 1886..	275 00
McRae, Roderick	Margaree or Sea Wolf Island	Feb. 3, 1898..	400 00
McLellan, Rod'k	Margaree Harbour, Inner Range	June 8, 1901..	50 00
McKay, R.	North Canso	Feb. 4, 1882..	350 00
McFarlane, Andrew	Pictou Island	June 8, 1892..	400 00
McDonald, John A.	Port Hood	May 10, 1880..	280 00
McLean, H.	Gillis Point.	Dec. 18, 1897..	150 00
McRae, Hector	McKenzie Point, Great Bras d'Or	Aug. 20, 1890..	160 00
McLeod, Norman	Cape North, Money Point	Oct. 14, 1899..	400 00
McNeil, F. X. S.	Iona	Nov. 16, 1901..	120 00
McRae, Donald	Kidston Island	May 17, 1892..	200 00
McDonald, Norman	Gooseberry Island or Marjorie Isle	July 4, 1884..	100 00
McAskill, Kenneth	Jerome Point	" 30, 1901..	250 00
McNeil, John C.	Piper Cove	Dec. 18, 1897..	120 00
McNeil, Laughlin.	McNeil Beach, Great Bras d'Or	Aug. 6, 1884..	60 00
McFadyen, Malcolm	Mabou Back Range Light	April 17, 1891..	50 00
McNeil, Daniel Y	Campbell Island, Victoria Co	July 30, 1903..	100 00
McEachern, A. L.	Cape George.	Sept. 8, 1898..	450 00
McLeod, Murdoch	Pugwash	Dec. 10, 1897..	300 00
McKenna, John L.	Cape Roseway, Light and Fog Alarm	Mar. 31, 1899..	800 00
MacIntosh, James.	Egg Island	July 28, 1899..	500 00
McDonald, Rod.	Clarke Cove	April 2, 1904..	100 00
McLellan, Baxter	Spencer Island.	July 21, 1904..	100 00
McLellan, Ingersoll L.	Economy Pole Light	May 16, 1899..	*6 00
McAdam, Hugh R.	Arisaig	Nov. 14, 1898..	100 00
McKay, Hector G.	Bird Island	May 21, 1901..	450 00
McLean, Malcolm	Great Bras d'Or Range, Front Light	Jan. 13, 1903..	100 00
McLennan, John	Henry Island	July 21. 1903..	400 00
Mackenzie, John	South-west Point, St. Paul Island	Nov. 16, 1904..	400 00
McCarthy, D. A.	Sheet Rock	Jan. 1, 1906..	500 00
Nass, Henry	Battery Point	Mar. 12, 1897..	300 00
Nickerson, Byron	Negro Island	July 26, 1897..	300 00
Nunn, George.	Sydney South Bar	June 20, 1872..	300 00
Nicholson, Alex.	St. Ann Harbour.	" 5, 1905..	140 00
O'Hanley, C. F.	Yarmouth Channel Light	May 6, 1906..	200 00
O'Leary, Wm. E.	Beaver Island	Feb. 22, 1900..	400 00
O'Hara, Theodore	Port Bickerton	Jan. 26, 1901..	150 00
Orchard, L. D.	Ragged Island Harbour Gull Rock.	" 1, 1877..	400 00
O'Neil Thos.	Low Point Fog Alarm	May 2, 1904..	500 00

† Crew paid by Department.
* Per month during season of navigation.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

NOVA SCOTIA—*Concluded.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Powell, A. M.	Page Island	Dec. 5, 1905..	200 00
Paysant, Jason	Little Hope Island	Oct. 22, 1901..	500 00
Pearl, Albert	Green Island off Margaret's Bay	Dec. 29, 1873..	500 00
Prince, Philip	Louisburg Light	Nov. 8, 1897..	350 00
Peters, John G	Low Point Light	Oct. 1, 1865..	460 00
Pettis, Wm	Parrsboro'	Dec. 6, 1888..	340 00
Palmer, Howard	Wolfe Point	Oct. 14, 1899..	250 00
Palmer, H. W	Lahave, Fort Point	May 22, 1878..	200 00
Perry, Levi	North East Harbour Range	June 17, 1899..	250 00
Peters, John N.	Brier Island Light	" 6, 1901..	400 00
Pope, John	Main-à-Dieu	Sept. 11, 1902..	300 00
Patterson, Wm	Dartmouth	June 3, 1903..	100 00
Patterson, C. D.	West End of Pictou Island	Mar. 29, 1905..	400 00
Pride, Freeman	Budget, St. Mary's River	Dec. 7, 1905..	200 00
Robinson, Charles	Black Rock	Mar. 16, 1885..	330 00
Ruggles, Frank	Boars Head	May 24, 1901..	350 00
Robicheau, B. H.	Cape St. Mary	July 5, 1886..	350 00
Rathburn, Mrs. S. M.	Horton Bluff	Sept. 3, 1879..	250 00
Ross, Robert	George Island Light and Fog Bell	Jan. 18, 1876..	250 00
Roblee, Jacob V.	Shafner Point	May 29, 1897..	150 00
Riley, Simon W	Annapolis	Mar. 7, 1892..	100 00
Richards, Stephen C.	Charlo Harbour Range	Nov. 4, 1901..	120 00
Ross, Alex. W	Little Narrows.	May 23, 1902..	120 00
Rogers, Lloyd	Amet Island.	Nov. 11, 1902..	450 00
Rose, John	N. E. Point St. Paul Island	July 17, 1897..	400 00
Roney, Henry	Granville Centre	Feb. 24, 1904..	75 00
Rudderham, S.	Sydney Range Front Light	Jan. 15, 1905..	250 00
Smith, Eph.	Sambro Inner Island Pole Light	Jan. 3, 1900..	100 00
Scott, M. C.	Guysborough Harbour	April 19, 1884..	220 00
Spencer, Robt. A.	Spencer Point	" 1, 1870..	125 00
Suthern, Edward W.	Westport	" 12, 1890..	350 00
Saulnier, John H	Church Point, St. Mary Bay	Aug. 8, 1878..	200 00
Sampson, C	Ouetique Island	Mar. 12, 1875..	350 00
Strum, James A.	Westhaver Island	Sept. 25, 1888..	200 00
Sollows, A. J.	Port Maitland or Green Cove Pole Light	Dec. 28, 1900..	75 00
Sampson, Theodore.	Beaver Island	Oct. 13, 1892..	80 00
Smith, Caleb	Salter Head Beacon Light.'	June 21, 1888..	60 00
Smith, Wm. B.	Westhead, Cape Sable Island	April 12, 1890..	200 00
Simpson, John	Pictou Custom House	Dec. 10, 1901..	100 00
Smeltzer, John D	Hobson Island	April 10, 1900..	300 00
Stevens, James Gordon	Sand Spit, Shelburne Harbour	Mar. 11, 1903..	280 00
Slaunwhite, S. P.	Terence Bay	Oct. 13, 1903..	100 00
Stewart, Sargent	Little Dyke	May 1, 1906..	25 00
Theriault, D.	Jerseyman Island	May 31, 1905..	300 00
Troop, Ralph	Troops Point	Jan. 23, 1906..	100 00
Vance, Geo. W.	Masstown or Debert	June 29, 1898..	25 00
Wolfe, Howard M.	West Ironbound Island	June 22, 1895..	250 00
Wells, Jas	Whitehead Island	Oct. 20, 1897..	510 00
Wambold, Jas	Sheet Harbour Passage	May 11, 1887..	50 00
Webb, Patrick	Harbour au Bouche	Feb. 19, 1896..	250 00
Webber, Jas. M.	Torbay	May 10, 1898..	300 00
Wynacht, W. H.	Cross Island Llght and Fog Whistle	April 13, 1898..	800 00
Warren, R. V	Ingonish Island	Sept. 17, 1903..	360 00
Walsh, John	Lingan Head	July 14, 1904..	200 00
Young, Uriah	Chester, or East Ironbound Island	Feb. 15, 1884..	400 00
Yorke, Freeman	Cape Sharpe Light and Fog Alarm	June 30, 1902..	750 00

PRINCE EDWARD ISLAND.

Anderson, Albert	St. Peters Range	July 25, 1900..	130 00
Allen, Joel S	Indian Point Pier	May 18, 1898..	375 00
Beaton, Angus S.	Hazard Point Range, Back Light	Nov. 21, 1902..	60 00
Bell, Wm	Tryon Head	Mar. 17, 1905..	200 00

* Per month during season of navigation.

SESSIONAL PAPER No. 21

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

PRINCE EDWARD ISLAND—*Concluded.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Clarke, Jesse George	Georgetown Range, Back Light	Aug. 14, 1901	150 00
Champion, Wm	Northport Range Lights	Oct. 25, 1897	100 00
Connors, George	Georgetown, St. Andrew's Point	June 3, 1901	150 00
Costain, Elijah	Miminegash Range Back Light	May. 18, 1906	40 00
Fraser, John	Summerside Range, Front Light	April 12, 1897	100 00
Gaudet, Agape	Big Tignish Range	Aug. 30, 1897	130 00
Gillis, Donald	Point Prim	Dec. 10, 1897	300 00
Gallant, Jos. J. D	Cape Egmont	Oct. 21, 1902	200 00
Hardy, Wm	Little Channel Range	July 26, 1875	100 00
Howatt, Abner J	Leards Range, Outer Light, Crapaud	" 22, 1893	100 00
Inman, James	Leards Range, Inner Light, Crapaud	Aug. 13, 1901	100 00
Jordan, M. L	Cape Bear	April 12, 1905	375 00
Kielly, John Andrew	Cove Head Lights	Nov. 27, 1890	90 00
Lewis, James	Brighton Beach Range	Mar. 1, 1899	100 00
Lavie, J. D	Souris, East Lights	June 23, 1905	300 00
Morrison, John D	Cardigan River	Aug. 15, 1901	100 00
McKela, Austin	Grame Point	Jan. 20, 1906	500 00
McDonald, John W	Tracadie	May 24, 1901	100 00
McRae, Daniel	Hazard Point Range, Front Light	April 6, 1900	70 00
McDonald, Lauchlin	East Point and Fog Whistle	Jan. 18, 1901	600 00
McDonald, John	Douse Point Range, Orwell	June 25, 1879	70 00
McLeod, Jas. H	New London	Jan. 29, 1896	125 00
McDonald, Wm	West Point	Aug. 22, 1876	300 00
McKay, Rodk. W	Wood Island	April —, 1899	250 00
McDonald, Angus	Souris, East Light	Nov. 13, 1880	300 00
McDonald, Jas. A	Savage Harbour Range	July 11, 1889	100 00
McLeod, Lemuel	Murray Harbour Front Light	Dec. 21, 1897	50 00
McPherson, Daniel W	Brush Wharf Range, Orwell	Jan. 13, 1899	60 00
McNeil, Alex. S	Block House Point, Charlottetown	Mar. 25, 1901	340 00
O'Brien, Patrick	Miminegash Range, Front Light	May 14, 1897	60 00
O'Ranaghan, Peter	Sea Cow Head	April 21, 1873	250 00
Phee, James	North Point	Sept. 4, 1897	300 00
Penny, Robert	Murray Harbour, Back Light	Nov. 11, 1897	50 00
Pino, Joseph N	North or Grand Range, Rustico	Feb. 6, 1897	125 00
Robertson, Alfred	Annandale Range	Oct. 5, 1898	100 00
Sinclair, Wm	Fish Island	Mar. 8, 1897	250 00
Stavart, Geo	Summerside Range, Back Light	Sept. 8, 1895	80 00
Steele, Colin	Panmure Head	June 3, 1901	250 00
Tuplin, Jas. C	Sandy Island, Cascumpec	May 5, 1897	300 00
Taylor, Chas	Dranley Point Range Lights	June 14, 1897	60 00
Taylor, Jas. W	St. Peters Island	May 1, 1897	200 00
Wiggins, G. W. J	Darnley Point Range	Oct. 16, 1896	125 00
Wright, Chas. L	Wright Range, Crapaud Harbour	June 14, 1894	100 00
Westaway, John	Georgetown Wharf	Jan. 16, 1906	100 00
Young, James	Wood Island Harbour	Nov. 14, 1902	80 00

BRITISH COLUMBIA.

Allison, Frank Fagan	Portier Pass	Nov. 12, 1902	*30 00
Brown, Wm. Henry	Ballinac Island	Oct. 3, 1901	200 00
B. C. Electric R. R. Co	Brotchy Ledge	1903	200 00
Blanchard, B	The Sisters Light and Fog Alarm	Feb. 20, 1905	600 00

*Per month.

STATEMENT giving Names and Stations of Light-keepers, &c.—*Continued.*

BRITISH COLUMBIA—*Concluded.*

Name.	Station.	Appointed.	Salary.
			$ cts.
Carpenter, C.	Dryad Point	Nov. 7, 1899.	†300 00
Crozier, James	Bare Point, Chemainus	June 12, 1897.	168 00
Clarke, M. G	Entrance Island Light and Fog Whistle	Nov. 26, 1897.	900 00
Codville, James	Pointer Island	Dec. 26, 1899.	360 00
Croft, M. A.	Discovery Island Light and Fog Whistle	April 1, 1902.	900 00
Campbell, W	Gallows Point and Middle Ground Beacons, Nanaimo Harbour		180 00
Daykin, William P	Carmanah Point Light and Fog Whistle	Nov. 4, 1890.	1,200 00
Davidson, John	Cape Mudge	June 27, 1898.	420 00
Davies, J. Wm	Scarlet Point	May 2, 1905.	1,200 00
Doney, John	Yellow Island	Nov. 1, 1905.	500 00
Eastwood, F. M	Race Rocks Lights and Fog Whitle	Jan. 31, 1891.	1,200 00
Erwin, Walter	Point Atkinson Light and Fog Whistle	Oct. 5, 1880.	1,000 00
Elsternan, F. W	Lawyer Island	April 1, 1905.	600 00
Franklin, Wm. Thos	Merry Island	Jan. 8, 1904.	360 00
Fraser, George	Amphritrite	April 2, 1906.	240 00
Georgeson, Henry	Active Pass Light and Fog Whistle	July 21, 1884.	900 00
Georgeson, James	Saturna Island, East Point	Oct. 26, 1889.	550 00
Grove, John	Prospect Point		300 00
Gallup, J. W	Proctor	Jan. 1, 1900 .	240 00
Georgeson, John	Walker Rock		240 00
Garrard, F. C	Lennard Island	Nov. 1, 1904.	460 00
Gillespie, W	Portlock Point	1905.	460 00
Harrap, R	Coffin Islet and Danger Reef	April 15, 1903.	300 00
Harrison, S. G	Berens Island	Nov. 4, 1897.	†300 00
Jones, William D	Brocton Point, Burrard Inlet	Aug. 20, 1890.	300 00
Johnson, Capt. George	Fisgard	July 30, 1901.	500 00
Kootenay Electric Light Co.	Kaslo	Dec. 1, 1897.	240 00
Moore, Hugh	Dock Island	May 15, 1903.	*20 00
McColl, S. W	Garry Point	July 24, 1898.	*10 00
McColl, S. W	Mouth Fraser River Lights	Mar. 1, 1903.	*25 00
McElroy, O	Pilot Bay	May 2, 1905.	360 00
McNeil, D. H	Fiddle Reef	Mar. 21, 1905.	400 00
McMillan, J. F	North Arm Fraser River	" 29, 1905.	240 00
McMillan, Jno. A	Denmans Island	Aug. 15, 1906.	400 00
Nicholson, A. P	Egg Island	1905.	600 00
O'Brien, Michael	Fraser River	Oct. 1, 1904.	900 00
Okell, Harold	Trial Island	Aug. 22, 1906.	600 00
Patterson, Thomas	Cape Beale	Mar. 2, 1895.	1,200 00
Reuter, F	Ivory Island	May, 2, 1905.	500 00
Rudge, C	Birnie Island	" .., 1905.	240 00
Sparks, T	Shoal Point and Middle Rock, Victoria Harbour	Jan. 29, 1903.	180 00
Sparks,	Brotchy Ledge		120 00
Stockett, Thos. R	Gallows Point	May .., 1906.	120 00
Whitaker, H	Sechelt	Oct. 19, 1904.	240 00

†Allowance, $600 per annum for mail service.

DEPARTMENT OF MARINE AND FISHERIES,
OTTAWA.

APPENDIX No. 17.

REPORT OF SUPERINTENDENT OF SABLE ISLAND.

SABLE ISLAND, July 2, 1906.

Superintendent of Lights
for Nova Scotia.

SIR,—I submit the following report for the year ending June 30, 1906 :—

Fortunately no wrecks or casualties occurred during the year.

Boats and apparatus are in the condition last reported, having been used only for drills and the landing of supplies, and met with no accident.

PATROL.

The island was patrolled fifty-six times, forty-three times in the morning, and thirteen times at night.

BUILDINGS AND REPAIRS.

No. 1 Station.

Coal house, 16 x 25 built and forge refitted.

Sailors' Home.

South side of roof removed and two gables put on so as to make a carpenters' shop on second floor. Addition to store room, 10 x 14.

No. 2 Station.

General repairs to shingles.

No. 3 Station.

West side roof of cattle barn reshingled. New concrete block foundation put under horse stable.

STOCK.

Both cattle and horses wintered well, due to the mild weather. At present all are in splendid condition, and the increase among the wild horses is, I think, above the average.

KILLED.

Eleven beeves weighing 6,608 pounds; consumed mostly fresh. Ten hogs weighing (approximate) 2,000 pounds ; shipped.

SHIPPED.

Fifty pounds of cranberries, salted hides and old metal.

SAILORS' CLOTHING ON HAND.

Sixteen jackets, 13 pair pants, 11 vests, 23 shirts, 13 caps, 15 suits underclothing, 31 pairs brogans, 17 pair socks.

BEDDING.

Twenty mattresses, 75 pairs blankets, 10 pillows, 5 spreads, 40 ticks.

LIVE STOCK.

Eighty-five head horned cattle, 35 trained horses, 2 stock stallions, 6 stock mares, 200 wild ponies.

UNIFORMS FOR STAFF.

A supply was received May 4 and on June 1 each man was supplied with three complete suits, two of white duck and one of blue, comprising pants, sweater and cap.

CENSUS.

No. 1 Station.

Superintendent R. J. Boutillier and family, including servant, 4 ; M. Noonan, Sydney Himelman, Thomas Naugle, John Faulkner, Richard S. Boutilier, R. Cleary (cook), John Dunn (carpenter), 8—12.

No. 2 Station.

Ruben Naugle, wife and child, 3.

No. 3 Station.

James Ritcey, wife and child, 3 ; Arthur Negus, assistant, 1—4.

No. 4 Station.

Gustav Soderburg and wife, 2 ; Alex. Byrne, Edward McKenzie, 2—4.

No. 5 Station—W. Light.

A. J. Horne, wife and family, 6 ; John Glazebrook, 1.—7.

No. 6 Station—E. Light.

W. H. Horne, wife and family, 6 ; Henry Naugle, 1.—7.

Marconi Wireless Station.

L. R. Johnston (chief), Henry Peirson, Walter Gray, James Boutilier, Theophilis Strickland (cook), 5.

Total, 42.

I remain your most obedient servant,

(Sgd.) R. J. BOUTILIER,
Superintendent of Sable Island.

APPENDIX No. 18.

THE HUDSON BAY EXPEDITION.

Extract of Report of Major J. D. Moodie.

Major Moodie, of the Royal Northwest Mounted Police, was in command of the government steamer *Arctic,* Captain Bernier, sailing master.

'The *Arctic* left Quebec on September 17, 1904, and arrived at Port Burwell, Ungava bay, on October 1. No ice was encountered on the voyage until we got to within a few miles of Fullerton harbour, when we ran through some slob ice, floating in and out with the tide. The inner harbour where we anchored was frozen over to a thickness of about four inches.'

'The winter passed quickly and pleasantly. The weather was not exceptionally cold, the lowest temperature being 52 degrees below zero.'

'On July 1, 1905, the *Arctic* commenced breaking her way out of Fullerton harbour. On July 8 the engines stopped, and on going on deck it was found that both blades of the propeller were broken off short, close to the boss. The chief officer was in charge of the deck at the time. Tackle was at once rigged, and the broken propeller hoisted up. By 7 a.m. next day a new one was fitted and partly lowered, when it was found that the slot to take the shaft key was not cut in the proper place and the blades would not pass through the trunk. This propeller had to be unshipped, and another which had been brought from Germany, up out of the hold. At 11 a.m. this was fitted and everything in place, and at noon we were once more under way.'

On the 10th the ice being still packed tight and no sign of open water to the south or west, I reluctantly abandoned the idea of getting to Churchill. There is no doubt we could have made it without difficulty; it was only a matter of time. I could not, however, take the risk of being delayed so long that there would not be time to look for another harbour in the straits before the arrival of the supply steamer. With a good steamer with plenty of power there would have been no difficulty in forcing a passage through almost any of the ice encountered, and no danger. During the day the ice opened, and we made some progress north until 3 p.m., when Captain Bernier reported the ice was closing and that it was unsafe to proceed.

'On the 14th ran clear of all ice in afternoon, and shaped course for Cape Southampton, Coates island, distant about 75 miles. Cape Southampton was made at 5.15 p.m. on the 15th and Mansfield at 9 p.m. Only a few small pieces of ice floating about here and there. On the 16th, between Mansfield and Digges islands a few small pieces were scattered about. Erik cove was made at 1 p.m. There were a few pieces of ice aground at the head of the harbour and some small bits floating in and out with the tide.'

'About 40 miles down the coast we saw what was supposed to be the harbour spoken of by Mr. Low and Captain Comer last year. Lay-to all night, and on the morning of the 18th steamed slowly up to the entrance. About six miles up the harbour we were stopped by a bar, and anchored in a cove. In the afternoon I took a boat across the bar to head of harbour, about 3 miles further up. There a good sized river empties in.'

'The land rises to a considerable height, with good flat benches along the river. These and the surrounding hills are covered with grass. The passage over the bar is too shallow to take a vessel through without considerable risk, and then only at high water. The only drawback to the harbour is that wherever the land is suitable for building the shore is shallow.

'The *Arctic* was moved to her new berth, and when the anchor was down the flag was run up and the harbour called Préfontaine harbour, the headland on the east side of the entrance being named Cape Laurier, and the island on the west side of entrance White island. This place is not shown on any chart, and is the best harbour we have seen; it averages about 1½ miles across. The natives say it was open this year about June 1, and that no heavy ice ever comes in from the strait. None was seen when we arrived, although there were patches of snow on the hills. On the 20th and 21st the boats were employed landing goods, and all but a few packages were got ashore. Tents were pitched and all perishable goods housed.

'On September 23, I received orders to send the *Arctic* to Quebec for certain alterations and repairs, and to proceed north with the *Neptune*.'

EXTRACT RELATING TO THE LENGTH OF TIME THE STRAITS CAN BE NAVIGATED.

'From my two years' experience there should be no danger to any well built and well engined steamer in coming into the strait and bay early in July. Possibly she might be delayed somewhat by ice if the winds had been continuous from the north-east, but she should not be in any danger. Everything depends upon what the prevailing winds have been, and last year is but little guide to this. In my opinion, and that of good men whom I have consulted, the south side of the strait is the best for steamers coming in. For sailing ships the north side is generally to be preferred as far as Big island, crossing from there to Diggas islands.'

Movements of 'Arctic' in 1906.—Captain Bernier's Reports.

The *Arctic* returned to Quebec, arriving on October 6, 1905. The necessary alterations were made at Sorel, and the steamer resumed her work in connection with the Hudson bay expedition on July 28, 1906. Instructions were given to proceed direct to Lancaster Sound, calling at Pond's Inlet, to serve notice to the whalers there or in Barrow strait, west of Erebus bay.

The following report was received from Captain J. E. Bernier, dated C.G.S. *Arctic,* Chateau Bay, August 3, 1906.: 'I arrived here at 10 a.m. to-day, all well. I received your telegram, and left at once for Pond's inlet, Erebus bay, and if possible Winter harbour, Melville island. I am endeavouring to push forward so as to be in time before the winter sets in. During the winter I will get ready for spring travelling. Will erect cabins at the different places of call, as per my last letters. Will be glad to receive commission letters and papers at Port Burwell next summer so I can get them during the fall, with any letters for officers and men. The officers, men and myself are all in good health, and wish to be remembered to the minister, yourself and other officers who wish our welfare.'

The following report was received from Captain Bernier, dated C.G.S. *Arctic,* Pond's Inlet, Baffin Land, September 29, 1906:—

C.G.S. 'Arctic,'
Pond's Inlet, Baffin Land, September 29, 1906.

The Hon. L. P. Brodeur, P.C.,
Marine and Fisheries, Ottawa, Ont.

Dear Sir,—I beg to inclose a copy of photographs taken by Mr. Lancefield during our trip last month, with the view of Albert harbour. We are now in winter quarters.

We have been expecting every day whalers to come, to serve notice upon them and collect dues and give them licenses.

We have done wonderfully well so far, and we have decided not to winter in Melville island, on account of the heavy ice from the Arctic and considering the amount of provisions on hand. The coast about Melville island does not open every year, and there being a risk of passing another winter there, it was decided after consultation that we could do nothing effective there, having taken possession of Melville island,

Price Patrick, Eglinton, Emerald, Byam Martin, Bathurst, Cornwallis, Griffiths, Lowther, Young's, Garret, Russell, Davy and Bylot islands.

We are now watching the whalers that might come any day. I am contemplating to leave here the latter part of July, to proceed to the northward towards Lincoln island and Jones sound.

We shall have used one-half of our coal by the spring. I may mention here that we have left a depot of provisions of five thousand seven hundred and eighteen pounds of selected articles at Port Leopold, and built a house over the same. At Erebus bay, we have restored the Sir John Franklin monument and placed the stone in a proper place and also repainted the headstones of the men's graves.

The *Arctic* is safe and sound, and has done her duty well, it is not expected of her that she can pass through ice of several seasons' growth, but with time she can go through all right.

The officers and crew are all well, happy and contented with their lot. We had the good fortune of having a large iceberg aground just near us, so our fresh water supply will be secure for the winter.

With our supply of guns and ammunition we expect to secure a supply of fresh meat for our use the coming winter. We have no less than sixty-five traps set out, and it is dangerous to come near the *Arctic*.

The officers and men wish to send their respects to yourself, and the heads of the department, for what you have done, both for us and our beloved ones left behind. We would consider it a favour if you will advise them through the press so we may receive their letters at Port Burwell, Hudson bay.

I have the honour to remain, sir,
Your obedient servant,

(Sgd.) J. E. BERNIER,
Commanding Officer.

P.S.—The captain of the Dundee whaler *Eclipse* said that they will bring letters in to Pond's Inlet before we leave here. Please give notice through the Press.

Your obedient servant,
(Sgd.) J. E. BERNIER.